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The Magazine

**RETAIL FORECASTING
COMES OF AGE**
Now You'll Know What
(And How Much) They'll Buy
This Summer Page 116

5 UNEASY PIECES
A Cold Look at Hot Trends:
Biometrics, Grid Computing,
Open Source and More Page 109

**HOW TO LIFT I.T.'S
LOW MORALE** Page 92

**Get the
CRM
You Need
At the Price
You Want**

**Airborne Express CIO
David Billings Did—
Here's How You Can Too**

Page 56





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Lead conversions at Quick & Reilly have gone up 50%.

—Donald E. Froude, CEO, Quick & Reilly

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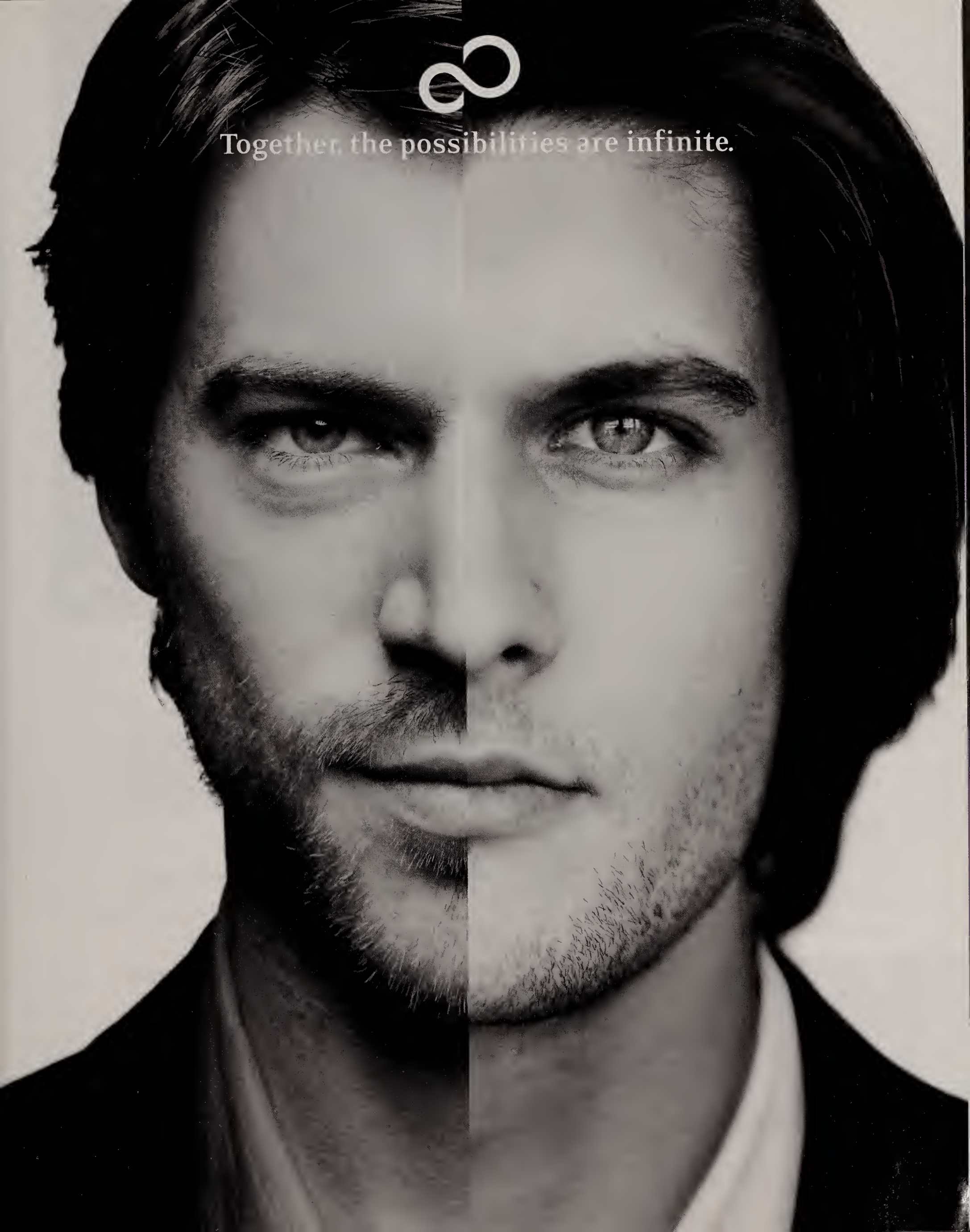


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VOL. 15 • NO. 14 • MAY 1, 2002

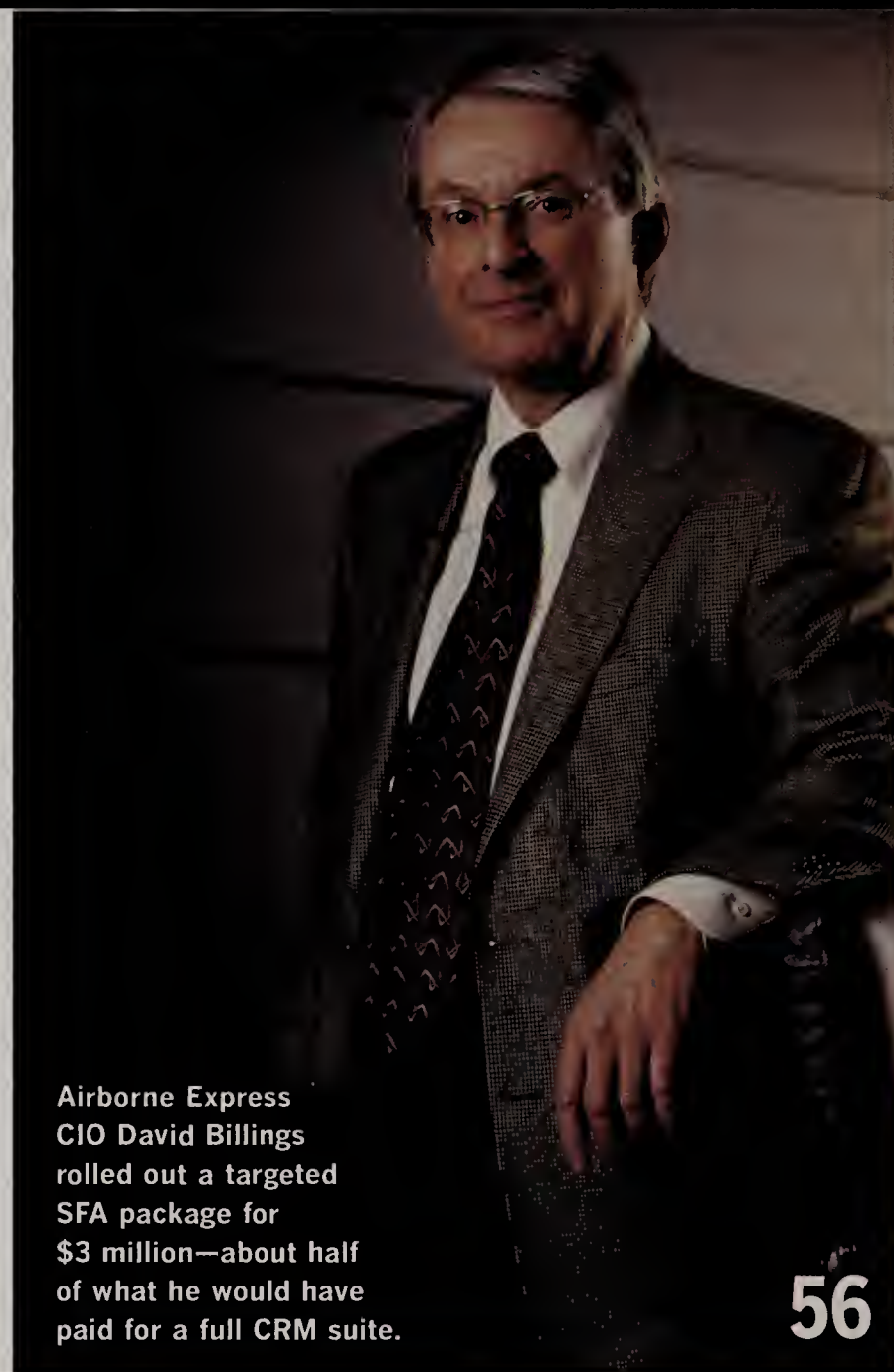
Cover Story

CRM | 56

Get the CRM You Need at the Price You Want

As the economy cuts into CRM spending, companies are looking for ways to move ahead without breaking the bank. *By Susannah Patton*

COVER PHOTO BY KEITH BROFSKY



Airborne Express
CIO David Billings rolled out a targeted SFA package for \$3 million—about half of what he would have paid for a full CRM suite.

56

Features

LEADERSHIP

What to Do When Morale Is Low | 92

You say you've tried Hawaiian shirt days and pizza party Fridays, and your IT department's morale is still in the pits. Forget gimmicks and lead. *By Simone Kaplan*

MERGER INTEGRATION

Call Together Now | 100

There was one sign over Cingular's door, but the company had a melange of call centers cobbled together through years of mergers. Here's how Cingular went from 60 specialized call centers to 20 new multifunction centers. *By Derek Slater*



With the task of consolidating 60 call centers and 11 billing systems at hand, Cingular COO Mark Feidler is calling on IT. In the long run, he says, "IT is one of the fundamental opportunities to differentiate yourself." 100

I.T. TRENDS

Five Uneasy Pieces | 109

CIO casts a skeptical eye on some of the most talked about tech trends: biometrics, business process outsourcing, collaboration tools, grid computing and open-source software.

By CIO Staff

FORECASTING TECHNOLOGY

They Know What You'll Buy Next Summer (They Hope) | 116

Retailers are looking to robust forecasting technologies to find upticks in the downturn. *By Meridith Levinson*

CASE FILES | THE NAVAL SEA SYSTEMS COMMAND

Building a Better Battleship | 126

The Naval Sea Systems Command finds the best approach to knowledge management is one step at a time.

By Stephanie Overby

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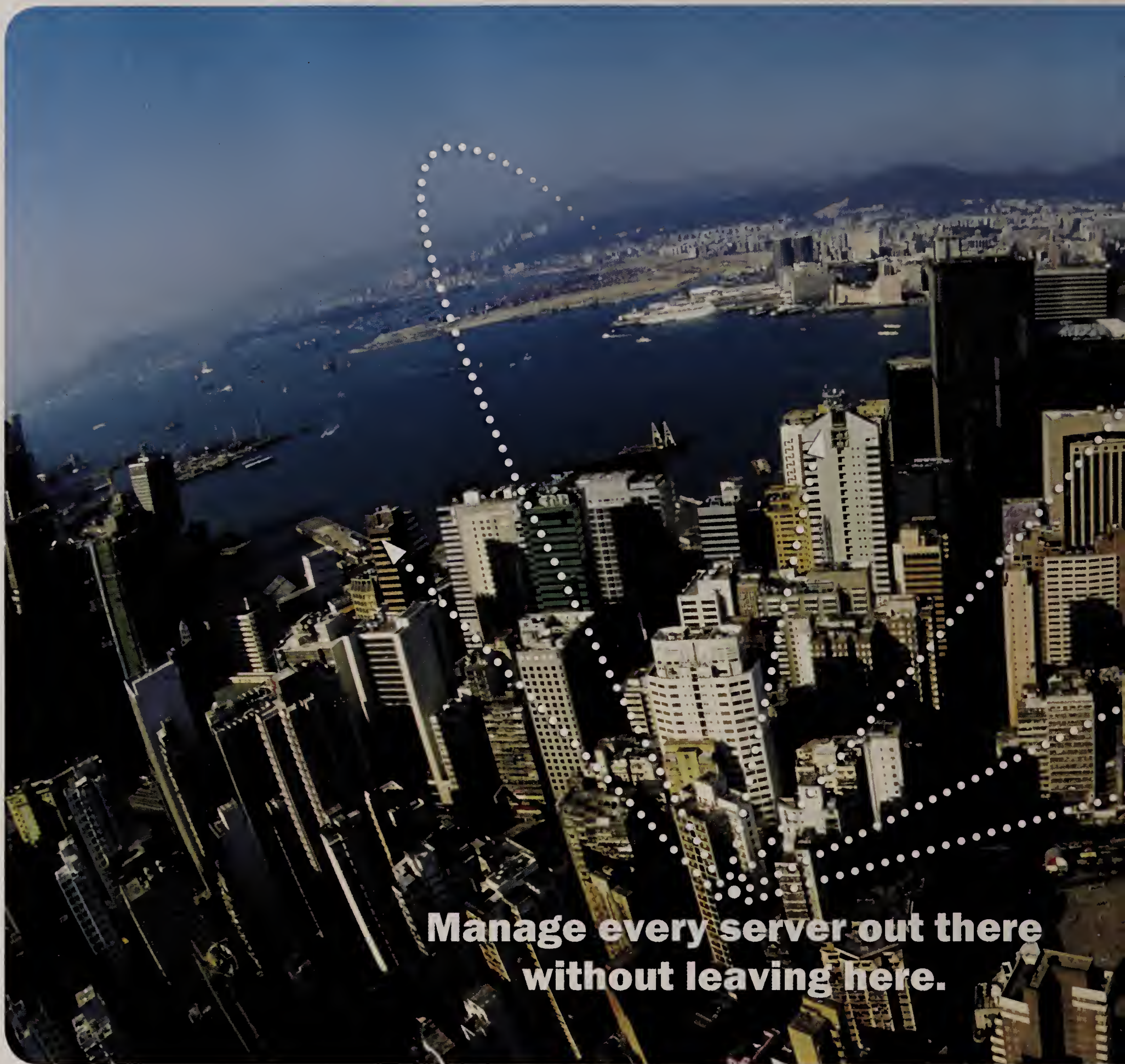


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Columns

CXO PERSPECTIVES

Show Me the Value | 45

Your CEO is counting on you to make sure technology investments really pay off.

By Jack Brennan

TOTAL LEADERSHIP

True Grit | 50

Conquering new territory is the leader's ultimate challenge. Daring thinking and focused execution are just the beginning of what's required. *By Christopher Hoenig*

Sections

TRENDLINES | 26

The toughest job dotcomers will ever love; A Road's Scholar in your car; Are birds mocking cell phones? *And more*

ON THE MOVE | 30

CIOs on the go—see where your IT peers are working now.

BY THE NUMBERS | 36

Focus on training—and keep your staffers.

EMERGING TECHNOLOGY | 132

Thousands of “dumb devices” are coming to a network near you. *By Fred Hapgood*

COOL PRODUCT | 136

USB phone power—your cell phone can get a charge out of your laptop.

NEW in CIO

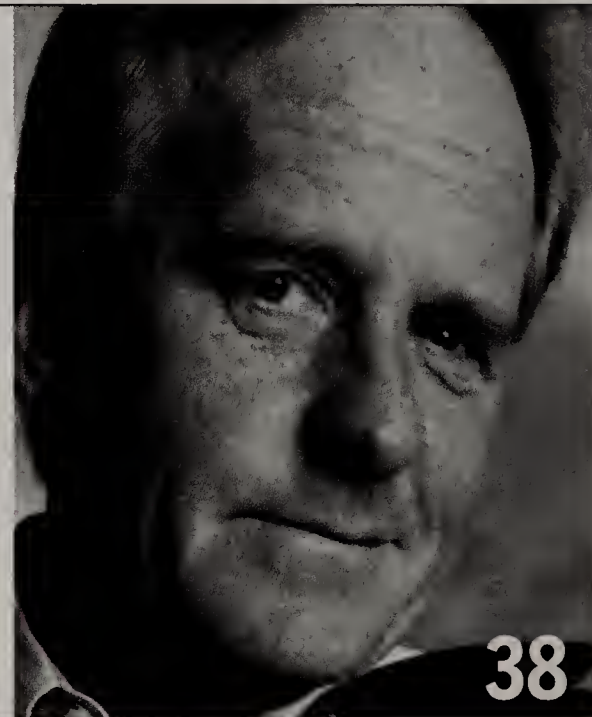
CIO OBSERVER | 38

By Jerry Gregoire

The Hardest Job in IT

A person could get shot for saying this, but the chief information officer position is not the hardest job in information technology. Technology sales is harder.

In Jerry Gregoire's new column, the former CIO of Pepsi-Cola and Dell takes a second look at the high-tech salesman.



38

UNDER DEVELOPMENT | 138

Your phone away from home.

COMPANIES TO WATCH | 140

Talaris looks to make it easy to make arrangements.

PUNDITS | 142

The Internet is a zoo.

OPINION | 144

REALITY BYTES

CRM may be a marketer's dream, but companies should still pay heed to privacy and ethical concerns. *By Alain Jourdier*

FROM THE PUBLISHER | 148

An Apple for the enterprise—how about an iMac on your desktop? *By Gary Beach*

In Every Issue

FROM THE EDITOR

Where's Morale? | 16

Low morale is a problem that must be managed in every company. But what lies at the heart of low morale?

By Richard Pastore

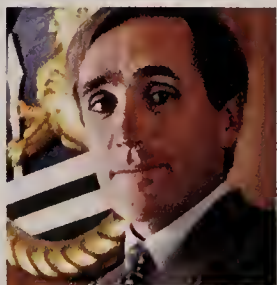
INBOX | 20

Reader feedback

INDEX | 150

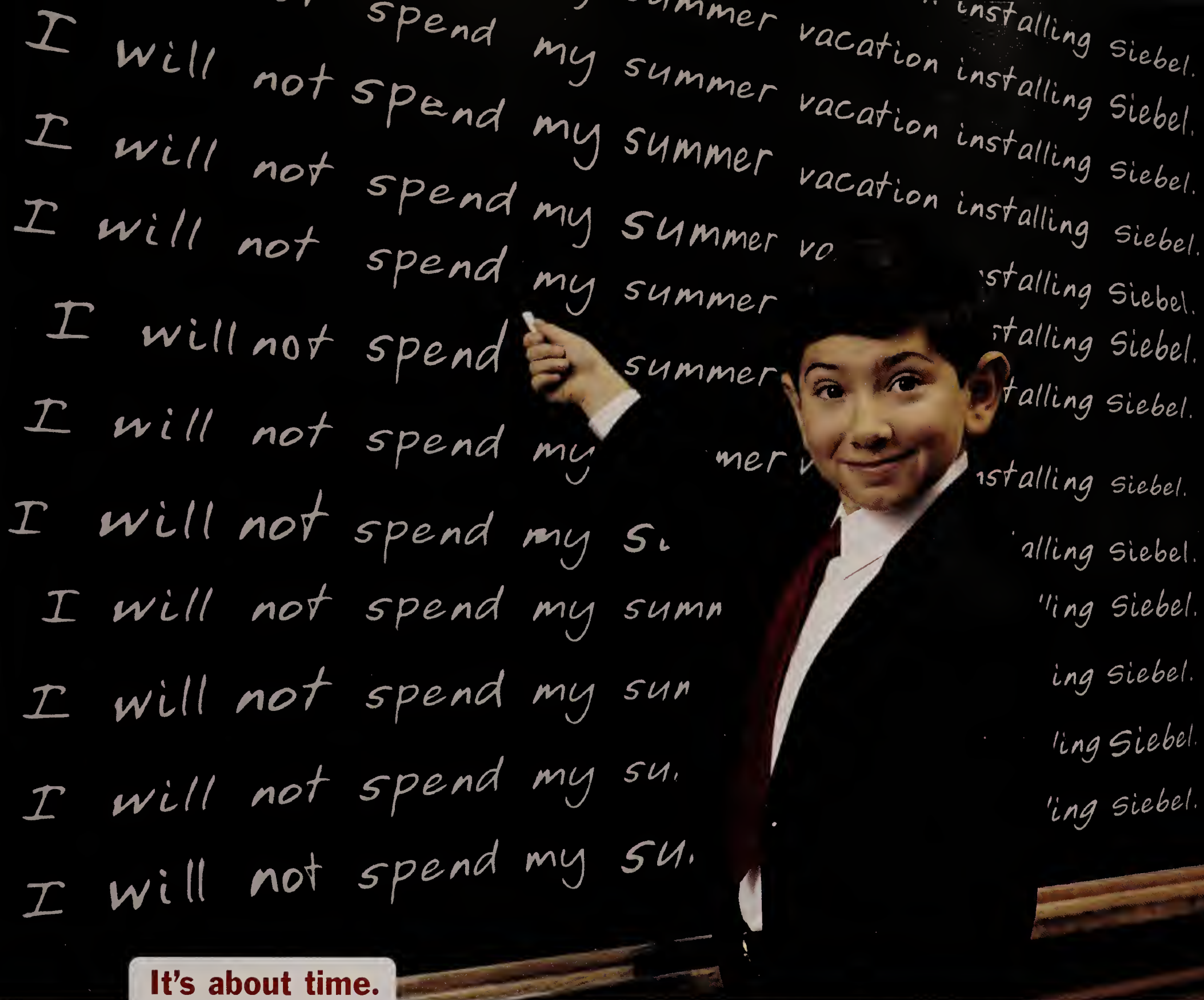
EXECUTIVE SUMMARY | 152

Abstracts of all feature stories found in this issue.



“It’s our view at Vanguard that the business management team should be taking the lead on business technology projects, looking to IT for facilitation but not leadership.”

—Jack Brennan, chairman and CEO of the Vanguard Group, on IT value Page 45



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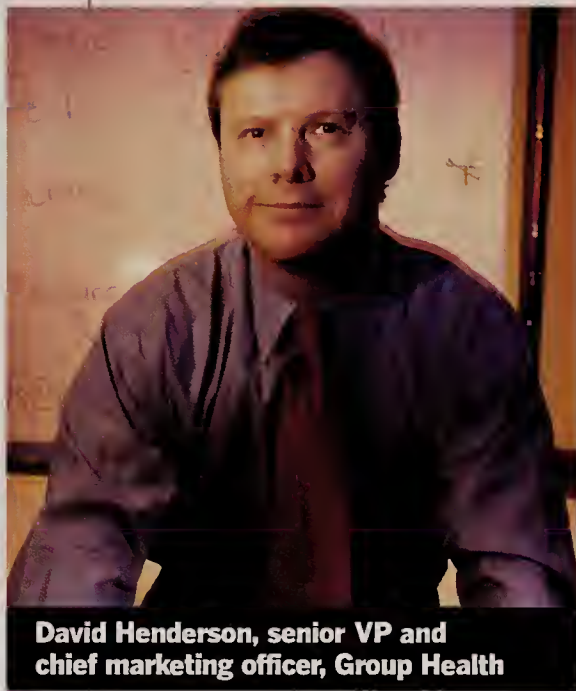


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David Henderson, senior VP and chief marketing officer, Group Health

WEB >connections

WEIGH IN

How is your CRM project going?

In **Get the CRM You Need at the Price You Want** (Page 56), CIOs reveal their strategies for taming the CRM beast. What methods have you come up with for implementing CRM within your time frame and your budget? Share your stories.

ASK THE SOURCE

How have you defined your IT culture?

In **What to Do When Morale Is Low** (Page 92), David Van De Voort of William M. Mercer says it's up to the CIO—not the HR department—to maintain morale in the IT department. Ask Van De Voort about the importance of honesty and open communication—or post your own spirit-building lessons.

LEARN MORE

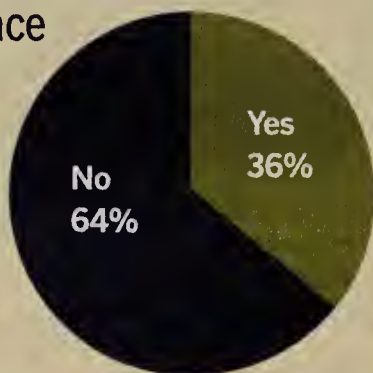
Interview with Cingular COO

Mark Feidler, chief operating officer of Cingular (see **Call Together Now**, Page 100), spoke with Executive Editor Derek Slater about call centers, hiring a CIO and more.

Find links to these stories and other resources in the Web Connections box at www.cio.com.

CIO Reader Poll Report

Can remote conferencing technologies replace the face-to-face meeting?



To answer this issue's Reader Poll, **Does your CEO understand IT value?** go to www.cio.com/readerpoll.

Peer Resources The Darwinmag.com Connection

CIO's online sister publication, Darwinmag.com, explains technology for the nontechnology executive. E-mail your colleagues the following stories that relate to this issue's features. Find the links at www.cio.com/printlinks.

Get the CRM You Need at the Price You Want (Page 56). Many technology projects fail for lack of communication between business and IT managers. Read how the CEO of one company was determined not to let that happen in Darwinmag.com's **This Changes Everything**.

Call Together Now (Page 100). Most business executives mistakenly think of integration as the exclusive province of gearheads. But true integration also involves the business side. Find out how in **Putting Two and Two Together** from Darwinmag.com.

Our Daily Web

MONDAY Tech Tact

Technology Editor Christopher Lindquist on what's coming and what it's good for.

www.cio.com/techtact

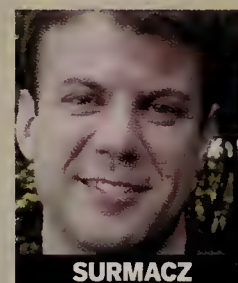
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SIX DANGEROUS MYTHS

ABOUT e-BUSINESS PLATFORMS.

THE WHOLE e-BUSINESS THING IS A FAD.

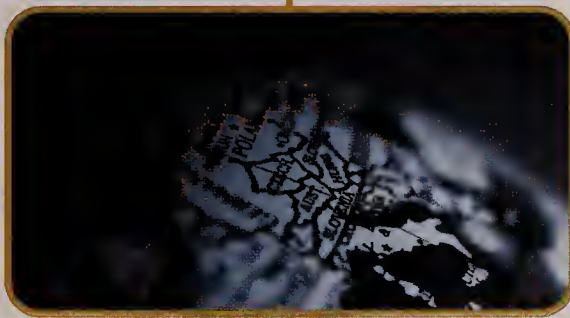
Nothing could be further from the truth. In times of economic downturn, it may seem prudent to put the whole e-Business issue on the backburner. But it's not. Tough times call for speed, nimbleness and agility more than ever. The time to get smart and implement e-Business solutions for your customers is today.



THE INTERNET CHANGES EVERYTHING.

The Internet does not change everything. It doesn't change the business rules that run your company. Or the infrastructure you've spent years building. Or the nature of your business. Or your need to generate revenues and profit.

The Internet is obviously a critical part of any e-Business. But the Internet is only a common set of protocols for the transport of information. It's how well you manage that information that determines the success of your business.



IT'S A ONE-BRAND WORLD.

This myth surrounds just about every significant e-Business platform discussion. Virtually every purveyor of e-Business platforms touts their version of this "one-brand" world. Their brand, of course. Big surprise.

At Sybase, we know it's just not true. Countless brands compete,

cooperate and commingle inside your company. It's laughable to pretend that any one external organization can "standardize" all the various protocols, systems, components, new technologies, languages, databases and vendor relationships that your business depends on to succeed.

Our open e-Business platform embraces diversity. Making all of this stuff work together is what our stuff is all about.

A WEBSITE IS A PORTAL. A PORTAL IS AN e-BUSINESS.

Well, not quite. A website is not a portal. And even if it was, a portal is not an e-Business.

Portals and websites along with application servers, databases, customer relationship programs, automated supply chains, an efficiently connected field force and the rest of your back office are all vital components of an e-Business. It's making them work together that's the trick.

Unless your data has the ability to travel from a customer's pager to your trusty OS/390 mainframe and then back to your customer via cell phone, you may very well have a website, but you really don't have an e-Business.

Our proven e-Business platform totally delivers this end-to-end functionality. It integrates every single aspect of your business. What's more, it has the scalability to constantly integrate your new components into the mix. Like say, 10,000 brand new customers, for example. Or a new CRM app.

Just something to think about when people offer you buzzwords instead of technologies.

IF AT FIRST YOU DON'T SUCCEED, THROW SOME MORE MONEY AT IT.

Hah. Very funny. But still a popular belief for a long time. Listen: It's all pure poppycock. The real e-Business solutions deliver real-life business results. By that we mean increased revenues, reduced costs and profit to your bottom line.

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So don't throw your money around. Look for an ROI that has a sense of immediacy. Invest carefully based upon proven past performance and reasonable expectations of return.

IT'S ALL OR NOTHING.

The Big Bang Theory: You need to do all of this at once. Not at all true.

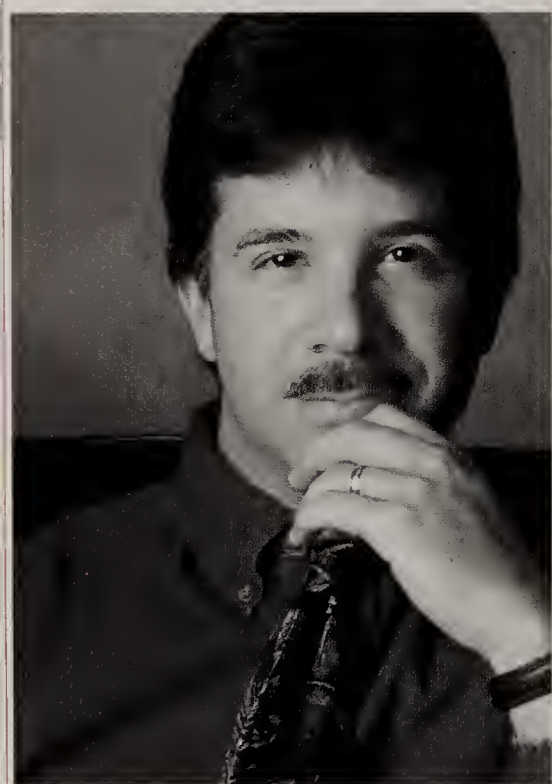
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From the Editor



"I wish the ring had never come to me...I wish none of this had happened."

"So do all who live to see such times, but that is not for them to decide. All we have to decide is what to do with the time that is given to us."

—From the film
*The Lord of the Rings:
The Fellowship of the Ring*

Where's Morale?

THE PAST YEAR'S ECONOMY has made for anxious, uncertain and—for those who experienced layoffs—despairing times. One victim has been morale, both for IT employees and the CIOs who manage them. Though the cause of the despair may be as uncontrollable as macroeconomic cycles or shortsighted corporate axmen, low morale must be managed in every company. In "What to Do When Morale Is Low," CIOs offer strategies to help in this daunting task (see Page 92).

What lies at the heart of low morale? It is a feeling on the part of the employee that the company no longer values him. That the company couldn't care less about his happiness or well-being or future. It's true that companies send signals that a person's work is not valued—the clearest signal for many IT employees this past year was an increased number of layoffs. Notice, though, that I said the *work* is not valued, not the person himself. Unfortunately, people equate the value of their work with self-worth.

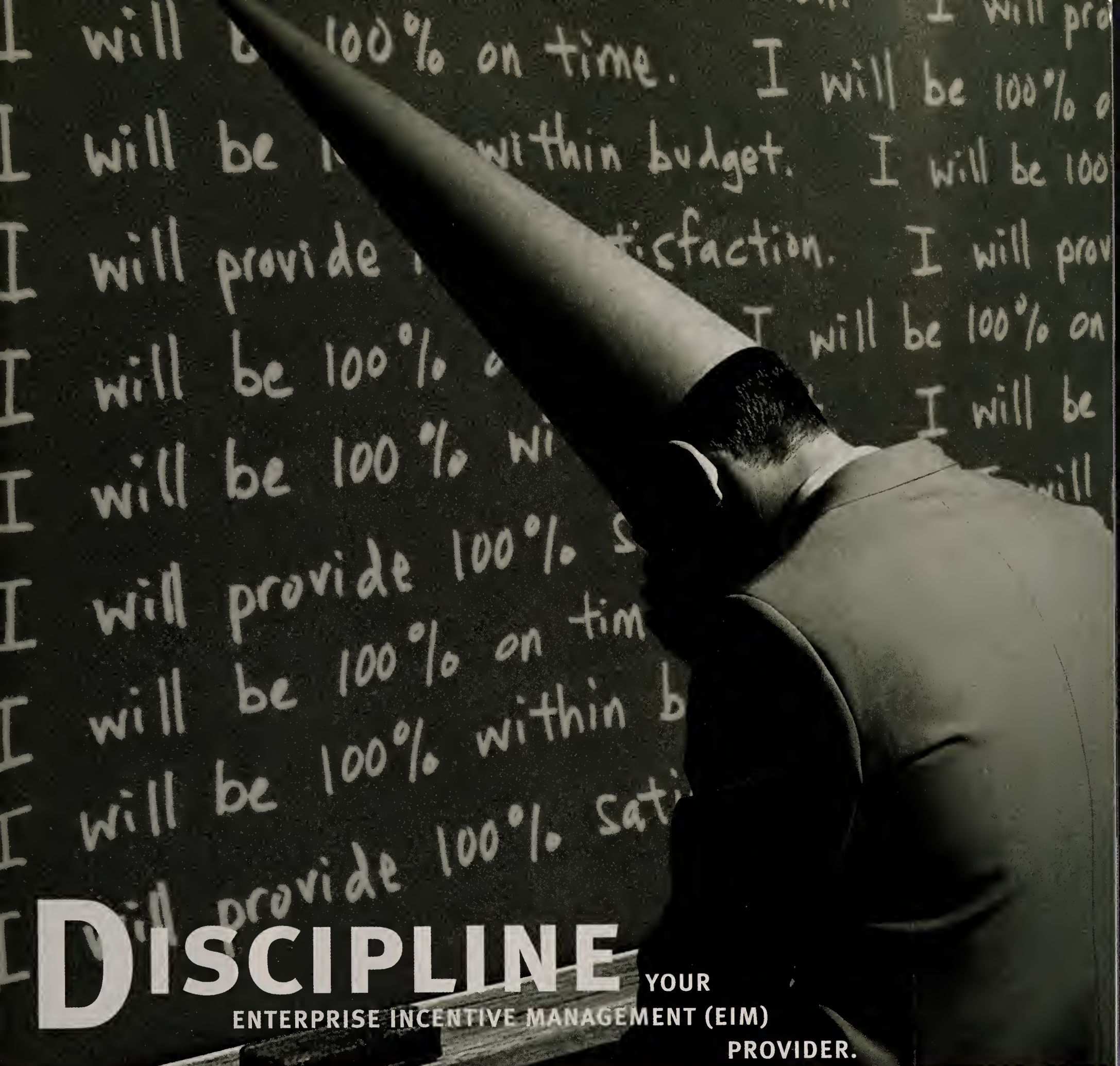
Whether we are struggling to bolster staff morale or keep our own spirits up, it's a pitched battle because we have knotted our value as human beings to what we do for a living. Yes, it's illogical to think that your boss's boss's boss, who barely knows you if at all, can render you worthless with a mere signature on a pink slip. People work to make money because money is the key to living

comfortably. But few professionals seem able to maintain that liberating perspective. I have seen it occasionally in new mothers who return to work after maternity leave. They realize the job is not such a big deal. They have a child; their value is independent of their employer's approval rating.

Ironically, you and I may not find our true measure of self-worth until we experience abject failure. I mean, to hit bottom. To have your job taken away, your dream car repossessed. To see a decade of retirement savings lose half its value in a single year. In this blackest of moments, there will be a light as clear as the glint on the edge of a knife, revealing that those things do not define you. You reevaluate who you are—you aren't a CIO or a project manager or a magazine editor—you are the person, loved by others, who once saved someone's life and tried to save another. You are the fifth-grader who comforted the kid everyone made fun of when his dog died. You are the high school sophomore who looked after an acquaintance who passed out from too much beer at the senior class picnic, who then became your lifelong friend.

You resolve, defiantly, to go on, to rebuild. Let them take what you have, including your job. Your value comes from within, fully knowable only to yourself. That's where you'll find your morale and the strength you need to do what you can with the time that is given to you.

Deputy Editor, pastore@cio.com



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*—Michael Volkema
Chairman and CEO, Herman Miller*

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Reader Feedback

THE CERTIFICATION SOLUTION

Regarding certifying CIOs ["Certify the CIO," Re:, Jan. 15, 2002], it seems like a good idea in principle, like New Coke was thought to be a good idea for Coca-Cola. While we are at it, why don't we certify CEOs and politicians?

Ira M. Bellach • VP and CIO • United Way of NYC • New York City • ibellach@uwnyc.org

I could not disagree more strongly with Joe Gagliardi's piece on certifying CIOs. While certifications are a decent yardstick with which to measure technical skills—especially on proprietary software where the people building and grading the exams are really experts in the field—a CIO's job is such a delicate balance of so many factors that objective tests are all but impossible. For example, faced with the same exact problem (which no two companies ever are), there is no one solution or even one best solution. The proper solution depends on many things, including the individual strengths and weaknesses of the CIO as well as the collective qualities of his team, company dynamics and so on. The problem of having to strategize in an ever-changing world is another issue without textbook right and wrong answers.

Eric Kassin

Software Development Manager

Chase Credit Systems

Woodland Hills, Calif.

ekassin@useyourmind.com

WIRELESS IN THE WORKS

I'm delighted that your stories show how several of our customers, including Everest Broadband, University of Texas at El Paso and Banner Healthcare, are using Western Multiplex's fixed wireless networking equipment to improve how they operate ["The Last Mile—Wireless Style," Emerging



Technology, Feb. 15, 2002].

I can personally attest to its effectiveness. After joining Western Multiplex a year ago, I quickly realized that we could take advantage of the equipment's high capacity, flexibility, security and reliability for managing operations, so I installed a wireless bridge (Tsunami 45Mbps full duplex, including an additional T1) between our manufacturing plant and headquarters in Sunnyvale, Calif., which also host our bandwidth intensive engineering organization.

We've boosted productivity because of the very high-capacity connection and lowered costs by eliminating two T1 leased lines (for voice and data).

Two clarifications, however: Until recently, the choices in point-to-multipoint systems have been limited to high speeds and short distances or slower speeds and longer distances. However, Western Multiplex offers a middle

ground—the first point-to-multipoint system that operates in the unlicensed 5.8GHz band, enabling it to deliver both total capacity of up to 360Mbps per cell site and distances up to eight miles. Second, unlike free space optics equipment, our microwave-based systems are not affected by weather and provide carrier-class reliability.

Rita Khayat-Toubia

CIO and VP of IS

Western Multiplex

Sunnyvale, Calif.

rtoubia@wmux.com

LEGACY MIGRATION

Kudos for your well-written article ["Pull the Plug on Your Legacy Apps," March 15, 2002]. We started our migration from our legacy systems environment back in July of 2000, by putting together an IT framework that encompasses both existing and emerging technologies. This intimidating task was not as arduous as one might think.

The real challenge was developing a plan that would provide incremental changes without impacting the competitive landscape and allow for the retraining of employees in the newer technologies.

Dave Keith

VP of IT and CIO

Security Benefit Group

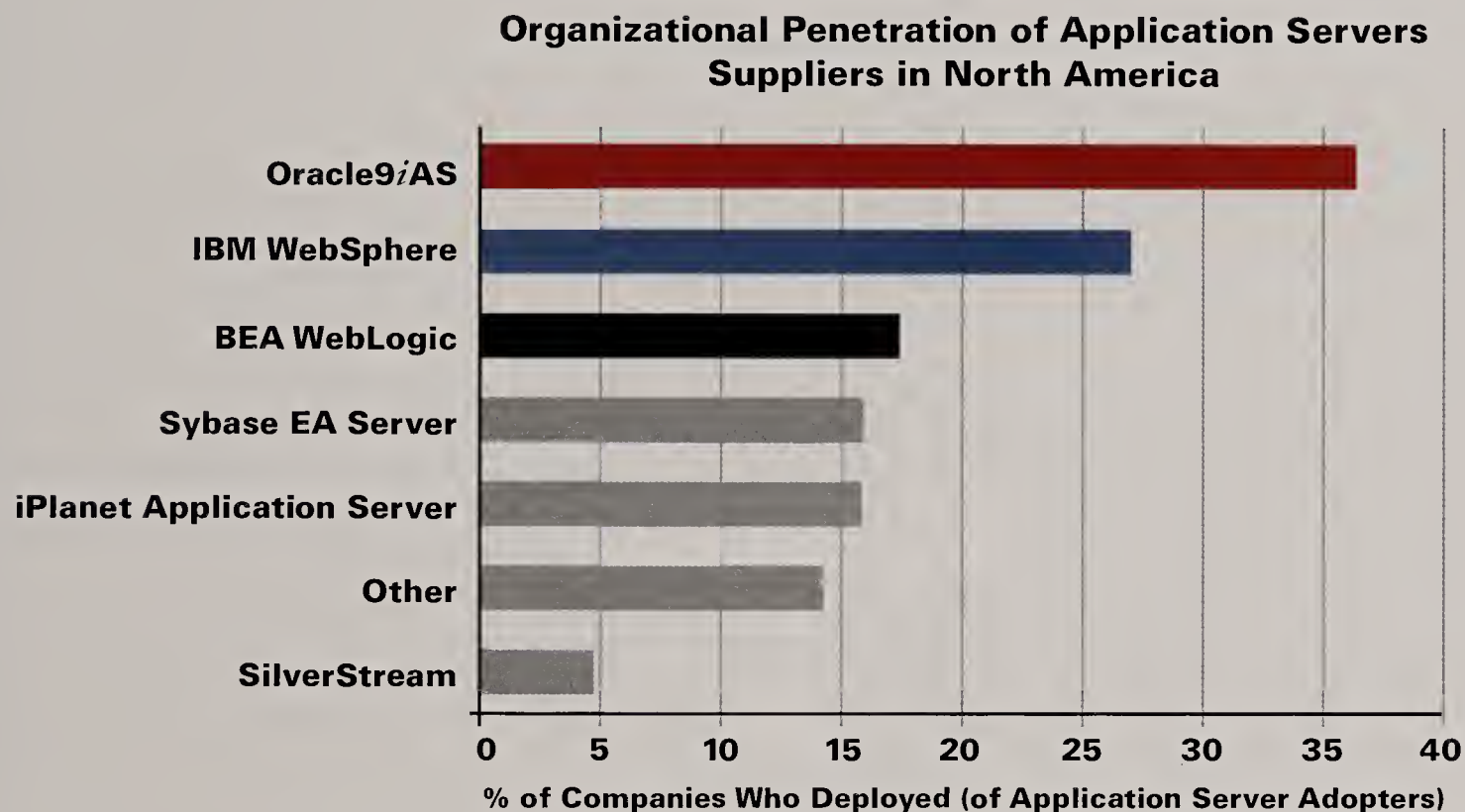
Topeka, Kan.

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WHAT DO YOU THINK?

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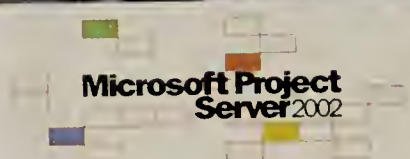


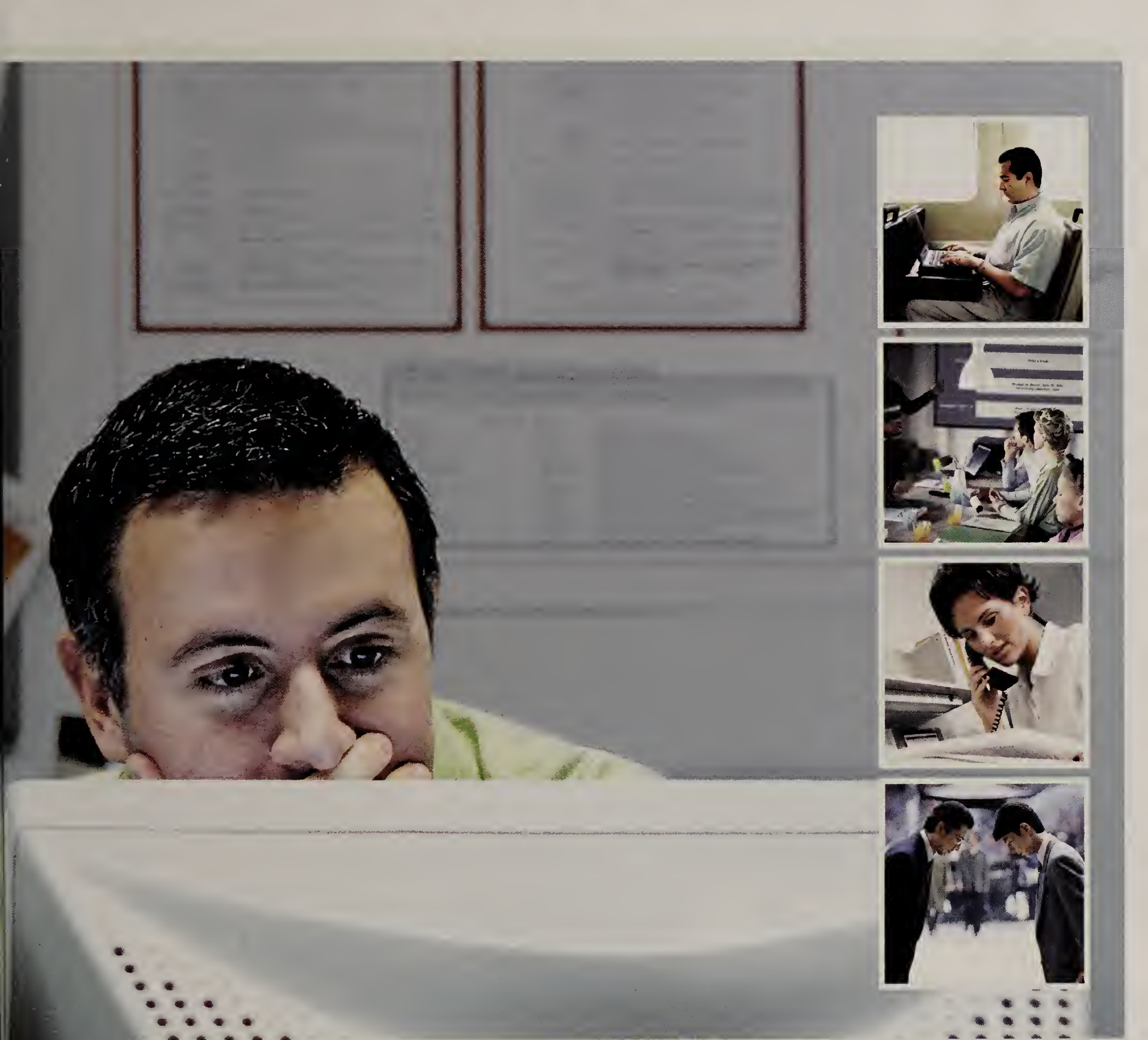
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Post-Dot World

Continued from Page 26

tech workers since the economy has softened. He says it's hard to tell if that's the result of a weak economy because his organization is too new, but he attributes the increased number of applications at least in part to tech workers' disenchantment with dotcom dreams of stock-option wealth.

"We're seeing a lot of people who are disillusioned with the dotcom phenomenon," he says. "It's clear to them that they're not going to be millionaires, and the idea of putting their lives on hold to make millions no longer appeals to them. They're no longer saying, 'I can worry about volunteering when I'm rich.' They realize they have to jump at opportunities when they present themselves."

MANAGEMENT

On the Road

FOR MANY OF US, the daily commute is a bore. There's the drone of the highway, the whiny rant of the local DJ and the all-too-familiar scenery day in and day out.

Within the next couple of years, though, that daily grind on the road could get a bit more interesting. The Road's Scholar, currently in development at Detroit-based research and development company ejTalk, is promoted as a "conversation agent"—a safe and entertaining tool for long drives. Using VoiceXML and a cell phone, the Road's Scholar lets solitary drivers interact with a robotic voice that asks trivia questions and shares tips such as how to classify wine and

understand stocks. "It talks to you and gets your brain going," says Emmett Coin, ejTalk CEO and industrial poet.

The most useful aspect of the Road's Scholar could be its ability to determine when a driver is nodding off and needs a little mental stimulation. Sensors that notice changes in motion on mechanisms such as the gas pedal or the steering wheel would activate the system, and the driver would hear, "I didn't mean to startle you, but you seem to be less attentive to the road just now. Would you like to chat for a bit?" The driver would respond with "yes" or even "sure" and can take a rousing quiz about low-key facts, such as state capitols. The information has to be entertaining but not too entertaining, Coin says. "We have to keep things interesting but have a nice balance to not be distracting," he says. "It's important to keep people safe." —Sarah Johnson

TECHNOLOGY

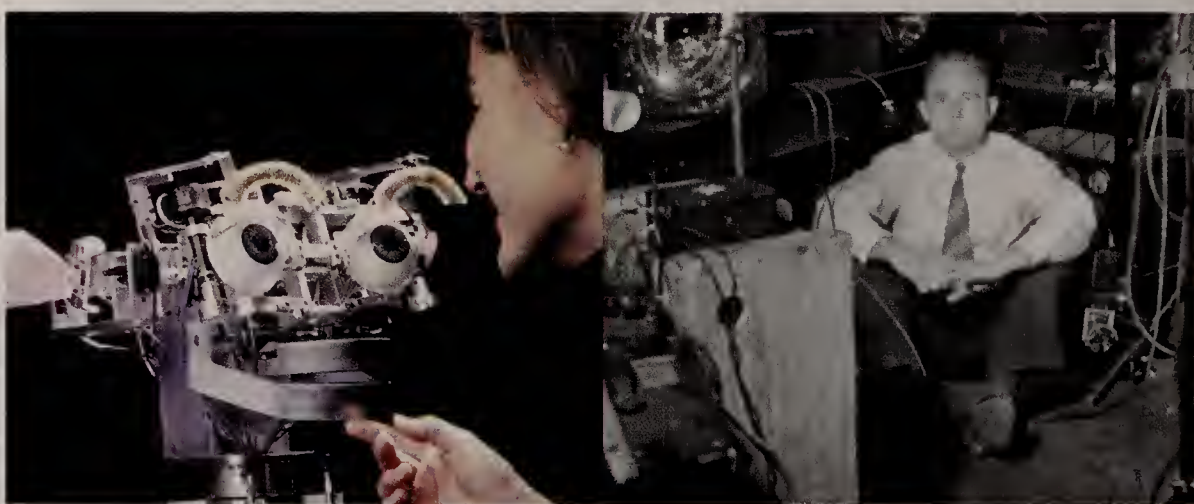
When Art Imitates IT

By Ben Worthen

WHILE THE TERM *installation* is typically reserved for ERP, CRM or even a new network, the MIT Museum is giving it new meaning. The museum is treating technology the same way the Guggenheim would treat the latest work by Christo, Bill Viola or any other modern artist.

For \$5, visitors can spend a few hours walking through the galleries and seeing installations of artifacts from the history of information technology, artificial intelligence and MIT itself. Exhibits include the first LISP computer, which looks like the back of a small refrigerator spray-painted neon blue; Phantom, a computer interface that simulates the sense of touch; complex holograms; and even the air-tank pranksters used to inflate a weather balloon in the middle of the 1982 Harvard-Yale football game.

The one knock is that visitors don't get to interact with the exhibits. This especially



AT MIT's technology museum, you'll find an expressive robot and learn about the history of holography artists.

takes away from the artificial intelligence section of the museum. Reading about and seeing a video on Kismet—a robot whose facial expression changes based on the tone of voice of the person speaking to it—and

then seeing the actual doll protected from all human sounds by 2-inch-thick glass is downright frustrating. Maybe that's payback for all the teasing that curators and artists took in high school.



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On the Move

Compiled by Tom Field

Busch and Morris Tag-Team as Intel CIOs

IT TAKES TWO CIOs to drive IT at Intel. The Santa Clara, Calif.-based chip manufacturer recently named **Douglas F. Busch** and **Sandra K. Morris** as co-CIOs. The two will share equal responsibility and authority. Busch will focus on desktop systems and infrastructure, and Morris on business systems and Internet technology.

Intel has always had a CIO function, but the person carrying it out had "Director of IT" not "CIO" on his business card. "This is the first formalization of the role," says Morris. No single event led Intel to create a formal CIO position, she says. "It was more a rethinking at the corporate level...as part of a yearly look at Intel and the progress we had made in e-business in the company." The goal of the two-CIO strategy is to provide equal focus on the e-business activity and that of the IT group, she adds.

As co-CIOs, Morris and Busch will continue to work closely together, as they have since 1997. "We have very complementary skills," Morris says. With Intel's 71 locations worldwide, data management is one of the duo's top priorities. "It's a business challenge as well as a technical challenge," Morris says. "We're looking at how we connect business systems end to end, and how we manage data end to end." To address these and other challenges, Morris's group and Busch's group will work on certain projects independently and others together, but the two CIOs will increasingly approach strategic planning as a team. "Doug and I do a lot of joint management of the programs. Over time, we will do more joint planning together," Morris says.

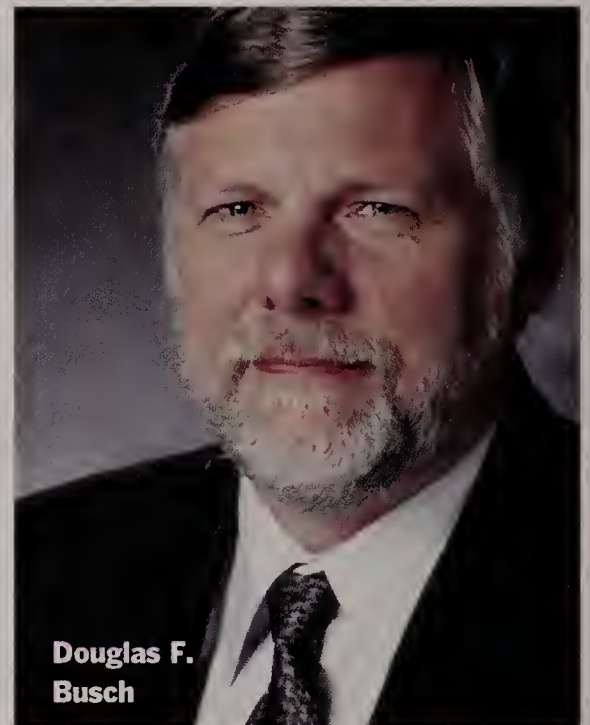
Both Morris and Busch have logged several years with Intel. Busch joined the company in 1987 and has held technical and management positions in manufacturing, logistics and IT. Before being



Sandra K. Morris

named co-CIO, Busch was the director of IT. Prior to joining Intel, he was the manager of R&D at the Battelle Memorial Institute, a Columbus, Ohio-based R&D organization (whose innovations include the dimpled protective coating for golf balls, xerography technology used in photocopiers and the bar codes used in universal product codes). He is also the cofounder of The Information Architects Collaborative.

Morris has been with Intel since 1985,



Douglas F. Busch

when she joined as a product manager. In 1999, she was promoted to vice president. Before her appointment as co-CIO, she was director of e-business. Prior to Intel, Morris worked at the RCA Corp.'s David Sarnoff Research Center in Princeton, N.J. She has also served as a faculty member at the University of Delaware, and has authored a book titled *Multimedia Application Development: Using Indeo Video and DVI Technology*, published in 1993 by McGraw-Hill. —Lafe Low

News of Other Moves

Rick Zelznak, former CIO of the state of Arizona, has left that job for a new role at Maximus, a Tallahassee, Fla.-based IT consultancy. As CIO, Zelznak directed the state's Government Information Technology Agency, and he is credited with improving electronic links between citizens and government agencies.

Robert Kolb, a 22-year IT veteran within the health-care industry, has been named CIO of Alere Medical, a Reno, Nev.-based care management company. In this new role, he will build and maintain technology platforms to accelerate the company's growth.

A dark, gritty photograph of a room corner. A window with a wooden frame is set into a wall. The floor is made of wooden planks and has a dark, cylindrical can lying on it. The lighting is dramatic, with strong shadows and highlights, creating a somber and confined atmosphere.

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E - G O V E R N M E N T

Virtual Court

By Stephanie Viscasillas

THOUGH VIRTUAL TRIALS may lack the caustic quips or acerbic edge of *Judge Judy* you may soon be able to watch them online. The state of Michigan is the first in the nation to create a cybercourt where people can plead their case without setting foot in a courtroom.

Set to debut in October, the court will begin by handling business disputes in excess of \$25,000. Matt Resch, deputy press secretary for Michigan Gov. John Engler, says the governor signed the bill into law in hopes that the promise of speedy resolutions to business lawsuits would attract companies—particularly technology companies—to the state.

"It's difficult to get slower than our current judicial system," says Todd Harcek, chief of staff for Rep. Marc Shulman (R-West Bloomfield), who proposed the bill. The cybercourt system will allow



the involved parties to meet via videoconference and submit evidence over the Internet. Only the judge is required to be in the state during the proceedings. To prevent wasting the court's time, there is a \$200 filing fee, and all parties have to agree to the rules of the cyber-

court before proceeding, including allowing the judge to render a decision without a jury present.

At press time, the Michigan Supreme Court was still ironing out the final details with a legislative oversight committee, but Harcek is assured there will be adequate security when the trials begin. Since the public still has the legal right to view proceedings, the site would have to be secure enough to keep certain documents contained but accessible enough for people to see what's happening just as they would in a regular courtroom. Resch says the virtual court will cost an estimated \$250,000 to set up, and those funds will come largely from the judiciary budget already in place.

B U S I N E S S E D U C A T I O N

Integration U

WITH SYSTEMS INTEGRATION issues consistently making CIOs' top 10 lists of Important Things to Do This Year, colleges are taking the hint and awarding specialized degrees in the field. First off the mark is Marlboro College in Brattleboro, Vt., which just announced plans to launch a master's program in systems integration management in September 2002.

The degree isn't as geeky as it may sound. The program will include courses on project management, business systems analysis, legal and ethical issues, and standard technical topics. It's meant to be as much about people and processes as it is about routers and CPUs. "The huge issue about integration is not technology, where the solutions are reasonably well-defined. The huge issue is governance. The messy change management side of integration is where things are falling down," says Paul LeBlanc, founder of The Graduate Center and president of Marlboro College.

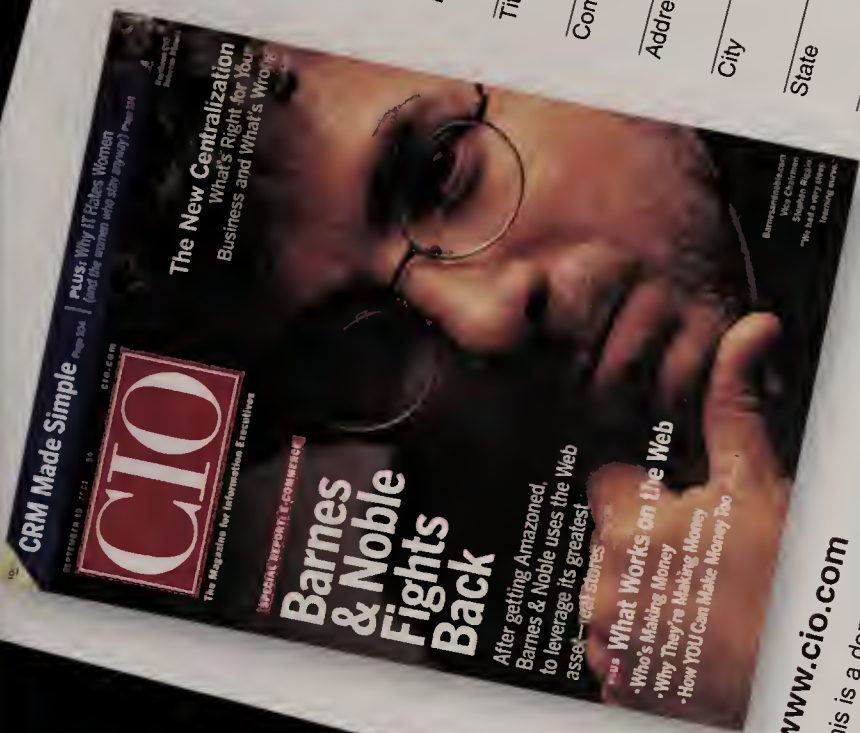
He adds that when companies have spent millions of dollars on systems that don't yield business payback because the systems can't exchange information, senior executives sit up and take notice. "They are increasingly seeing it as a business issue," he says. Funny how a direct hit to the bottom line will do that. Learn more about Marlboro College's systems integration management program at www.gradcenter.marlboro.edu. —Carol Hildebrand



feedback

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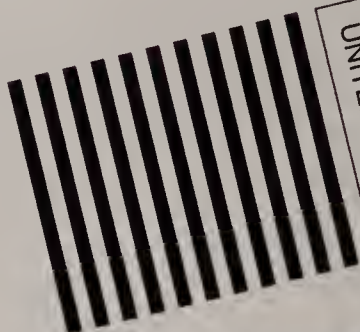


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You won't have to worry about birds imitating your cell phone ring anytime soon.

W I R E L E S S

Bird Calling

By Ben Worthen

ONE STORY MAKING the rounds on the Web is that birds living in urban areas have started to mimic the rings of cell phones in their songs. It's a potential nuisance of Hitchcockian proportions. A single starling chirping by a sidewalk café could cause hundreds of cases of tennis elbow as socialites and yuppies reach for their phones. More terrifying is the carnage a winged beast could unleash if it were unable to differentiate between the coo of a mate and the ring of a young woman's cell phone. It's chilling. Fortunately, it isn't true.

John Bianchi, a spokesman for the National Audubon Society, says that while there have been documented cases of birds repeating car alarms and the beep trucks make when they back up, they simply don't hear enough cell phone rings to learn the call. "If you put a starling in a cage and played [a cell phone ring] over and over again, it would get it," Bianchi concedes. But a bird being attracted to a cell phone ring "is something that no one needs to worry about—ever."

A more pressing problem, at least to the ornithologists, is that noise pollution has caused some birds in big cities to lose their ability to sing. "Singing is a learned activity; it is not innate," Bianchi says. "In some big cities where there is a lot of noise, groups of birds don't remember or know their full song."

HOT TOPIC



CUSTOMER RELATIONSHIP MANAGEMENT

What We're Buying *By Lafe Low*

WHEN YOU LOOK at the IT shopping lists of most companies, CRM technology is consistently at the top. In fact, CRM spending will outpace spending in other infrastructure technology categories such as content management and supply chain management, according to a recent report from Jupiter Media Metrix.

U.S. businesses, 26 percent of those surveyed, are expected to spend \$500,000 or more on CRM technology over the next two years. According to survey responses, spending levels on CRM are forecast to rise from \$9.7 billion in 2001 to \$16.5 billion in 2006. Investments in analytical CRM packages such as marketing applications are expected to swell from \$5.2 billion in 2001 to \$8.7 billion in 2006. This segment will ultimately account for 53 percent of

the CRM market. Spending on CRM technology for operational contact centers, which currently accounts for 54 percent of CRM spending levels, should remain constant for the next five years, then slow in 2006 as that segment of the market matures.

Among industry sectors, Jupiter expects financial services companies to buy up the most CRM technology, and spending forecasts to grow from \$3.1 billion in 2001 to \$5.4 billion in 2006. Other market segments investing heavily in CRM include retail and telecommunications. Retail CRM spending could reach \$3.2 billion in 2006, up from \$1.7 billion in 2001. Telecommunications companies could spend as much as \$2.9 billion in 2006, up from \$1.9 billion in 2001.

The growth in CRM investments is following the need for technology to back up electronic customer contact. The same report indicates that online customer service contacts will grow from 870 million in 2001 to 4.7 billion in 2006.

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By the Numbers

By Lorraine Cosgrove Ware

FOCUS ON TRAINING

CIO's most recent IT staffing survey found that IT training is the most utilized

benefit in hiring and keeping IT employees, increasing 10 percent in January 2002 from November 2000 levels. Monetary incentives to sign on with or stay at organizations are

less common, with the use of hiring bonuses and staying bonuses continuing to drop by 43 percent and 47 percent respectively from November 2000 to January 2002.

CIO RESEARCH

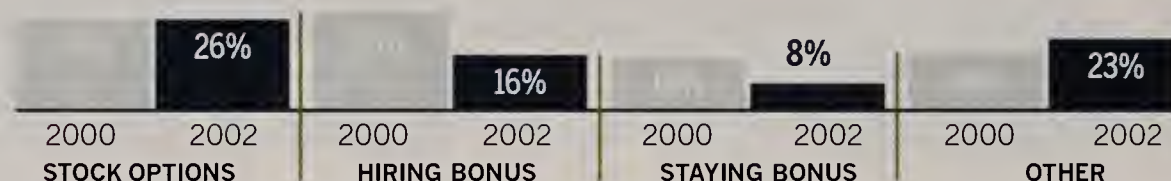
Companies Place a Continued Focus on Training

What benefits do you offer to attract or retain IT staff?



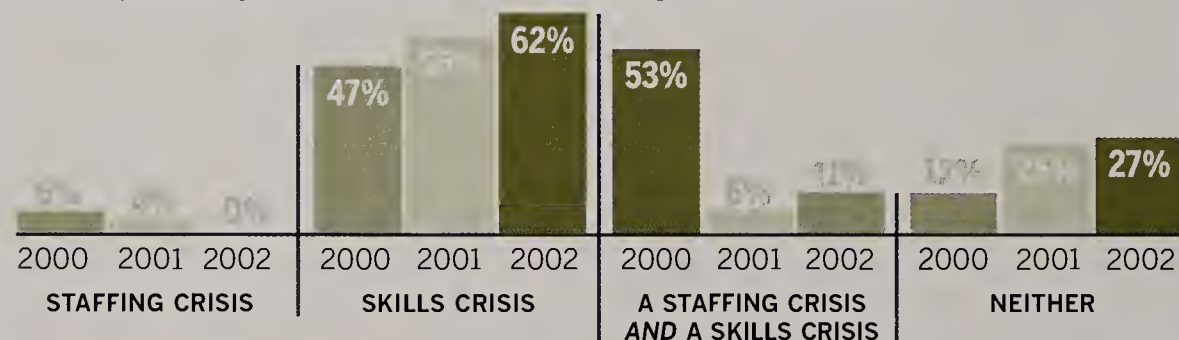
Companies Report that Monetary Rewards Are on the Wane

How are you enticing your employees to stay?



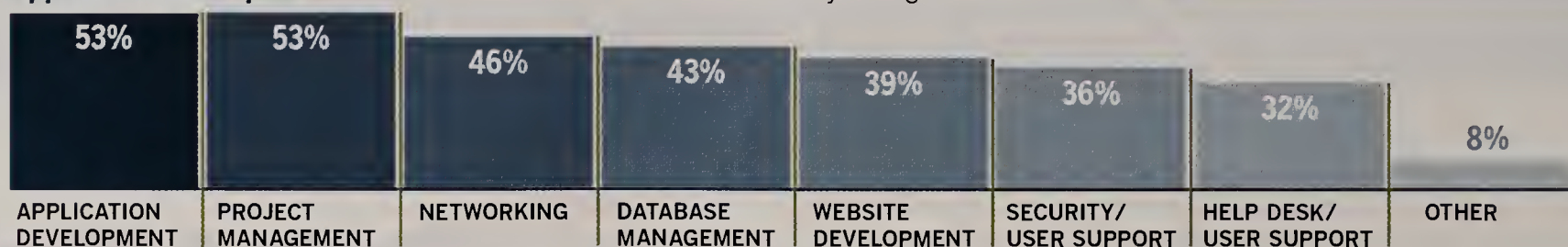
It Is Clear that Skilled Employees Are Still in Demand

In your opinion, do you believe that there is an IT staffing crisis or an IT skills crisis?



Application Developers Wanted

What IT skills are most in-demand in your organization?



CIO's IT staffing survey was administered online from Jan. 1 through Jan. 28, 2002. Results shown here are based on the responses of 278 IT professionals. For the most part, survey respondents had hiring responsibility in their organization (89 percent).

Best Practices

Use current employees to train each other. Training doesn't have to be in the classroom. Instead, share in-house know-how using existing means, such as your company's intranet.

Get vendors to train workers. Patricia Kennedy, COO, and Kelly Knight, IT director at Acsys, a staffing services company based in Ipharetta, Ga., suggest that CIOs offload training to vendors. "Ask your vendors to provide some online or videoconferencing sessions for your staff," she says.

Communicate. If you're cutting training, be open and honest with your staff about why. Kennedy recommends that CIOs listen to their employees and address their needs directly. "Your staff will tell you what they need in terms of training and job satisfaction," she says.



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Viewing the World Without Spin

The Hardest Job in IT

A person could get shot for saying this, but chief information officer is not the hardest job in information technology. Technology sales is harder.

BY JERRY GREGOIRE

CIOs GET 70 PERCENT of their information about new and quickly evolving technologies directly or indirectly from salespeople, according to a study done for *The Wall Street Journal*. Scary, but not surprising. It's no secret that I've never been real fond of technology salesmen or their endless shenanigans, but still, I have to give these folks their due. As hard as a CIO job seems sometimes, it's difficult to conceive of anything harder than selling software. Imagine making your living selling broken stuff—code with more bugs than a cathouse mattress. Or having to routinely promise features that don't yet and may never exist (a practice known as overhanging the market), at prices that bear no earthly resemblance to the product or service being rendered.

There's a book I think you and all of your managers should read called *How to Sell Technology: Technology Sales Is a Premeditated Sport*, by Paul DiModica. It's not *Ulysses* and it's not likely to be made into a screenplay anytime soon, but it's a worthwhile read for a couple of reasons. First, it goes a long way toward explaining why salespeople do some of the weird things they do, and second, this book can be a valuable tool for teaching your folks how to sell technology projects within your company. Oh, and while you're at it, give a copy



to your administrative assistant. I'm sure he will get a big kick out of the section on the six ways to "get past the gatekeeper," particularly the "intimidation method."

I happened across *How to Sell Technology* on the Internet. DiModica's website (www.itsalestraining.com) promotes the book like an infomercial, promising to reveal "secret proven formulas" and "dramatically increase your income and closing ratio," complete with glowing and untraceable testimonials and a free bonus if you order the manual within the next 24 hours (24 hours from when, it didn't say). Expecting the worst, I paid my hundred bucks, and in a couple of weeks, the 120-page soft-cover, ring-bound manual arrived. On the front, a youngish looking man (who I assumed at the time was DiModica), wearing a David Byrne-size jacket, leaps into the air and points at the sky. That evening I pulled up a chair in my workshop and flipped to the first section, "Perception Is Reality." What a way to start, I thought. I set the book down and went to get a beer.

ILLUSTRATION BY LYNN BENNETT



- 1 This is the **FOREMAN**
- 2 That placed the **Order**
- 3 That went through the **Dealer**
- 4 That notified **Contracts**
- 5 That alerted **Manufacturing**
- 6 That checked with **Accounting**
- 7 That contacted **Shipping**
- 8 That sent the **Delivery**
- 9 That sealed the **Process**
- 10 That lives in the **Business Integration Software**
- 11 That we built **Together.**



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It's kind of a shame they didn't take a more dignified approach to marketing this book. My guess is that it will be overlooked by a lot of people who will assume that the contents are just as hollow as the website. In fact, the book deserves a lot more respect than that. DiModica opens with an admonishment that ought to hang on the wall of every CIO's office. It reads: "If you can't pick up the phone and cold-call, or handle the objections from a tough chief executive officer of a large company or the drilling probing of a small business owner because you are afraid, then you should get out of technology."

Amen.

Sadly, many great ideas have gotten lost in the explanation. The ill-prepared messenger, kicked in the teeth so often he could headline in Branson, eventually learns it's safer just to turn in the direction of the skid.

Using case studies and exercises, the book goes on to describe

your problems (pain) and intrigue you enough to want to speak with me for 20 minutes. I've got to show respect, be succinct and accurate, get in, get out and not waste anybody's time. Most salespeople don't know how to do that.

So what are the top mistakes people make when selling technology?

Well, first of all, most of them come to sell instead of listen. They're not prepared, and they tend to shoot from the hip. Second, they don't know what they're selling.

They don't understand their product?

No, it's deeper than that. They don't understand the value of what they're selling and, consequently, can't explain its value. And third, they sell technology instead of a solution.

Do you think we underappreciate technology salespeople?

Oh, yeah! They're unbelievably underappreciated. It's because of the pressure—the churn and burn. Buy cycles are always different and longer than sell cycles, and it's always a question of

how to make quota. The pressure is tremendous. CRM systems have raised the visibility of what we do to the point where every minute of every day, every meeting, every forecast is constantly being evaluated.

If selling computer software and services were an Olympic sport, Paul DiModica would be tested for steroids.

an approach to selling technology and big projects that is at once creepy in the way it manipulates situations and language, and inspired in its directness, simplicity and packaging. Some of the material will probably be a little disturbing for those of us who've spent most of our working lives on the receiving end of the pitch. And some of the tactics DiModica recommends are shortsighted, to say the least. But these are problems the reader can easily spot and correct.

DiModica and I met in a restaurant in Buckhead, Ga., to talk about his book. He is *not* the youngish man on the cover. If selling computer software and services were an Olympic sport, Paul DiModica would be tested for steroids. Smart, earnest, hyper, a little long-winded and a genuinely nice guy, I barely said more than hello before he launched into a soliloquy on his book that threatened to break 30 minutes. Sensing he was about to take a breath, I interrupted.

Gregoire: Paul, are you selling all the time? Do you ever stop selling?

DiModica: I don't know. Probably not.

Why are so many of the salespeople I've come across so hard to put up with?

Most salespeople have no clue how to sell. The most important thing we teach in our program is respect for the senior executive and his time. There are 262,000 technology companies in the United States. So let's say 10,000 of them think they have something to sell you. That's a lot of traffic coming to your desk—mail, phone calls. Now, let's say I've got a great new company with an unbelievable new technology. I will never get to you unless I can create great communication, address

So why would anyone want to be a salesman?

Good question. The pay is good, if you're good at it. It's independent; you have the ability to be on your own. It's ego too—it's for people who like to win.

Ah, Yes, Winning

Many of the IT folks we all know are far more comfortable with processes than people. Two of the most important yet often overlooked soft skills we should develop in our up-and-coming managers are the ability to address an audience without staring at their shoes and the ability to explain (sell) worthwhile projects to management.

Years ago, fed up with wasting time and money on presentation skills seminars, I began signing my people up for acting classes at the local community theater. At graduation, each was expected to take a role in a public performance during that year's theater season, for which the entire department would always turn out. It did wonders for their confidence and poise. (I can't say it did much for the community theater's longtime director, who, rumor has it, was so deeply traumatized he was last seen wandering shoeless in North Dakota.)

The next step, had I thought of it at the time, would have been a week or so studying DiModica's program.

Trust me. Buy the book. **CIO**

Editor at Large Jerry Gregoire is the former CIO of Dell Computer and Pepsi-Cola. He is haunted by reader feedback at jgregoire@cio.com.



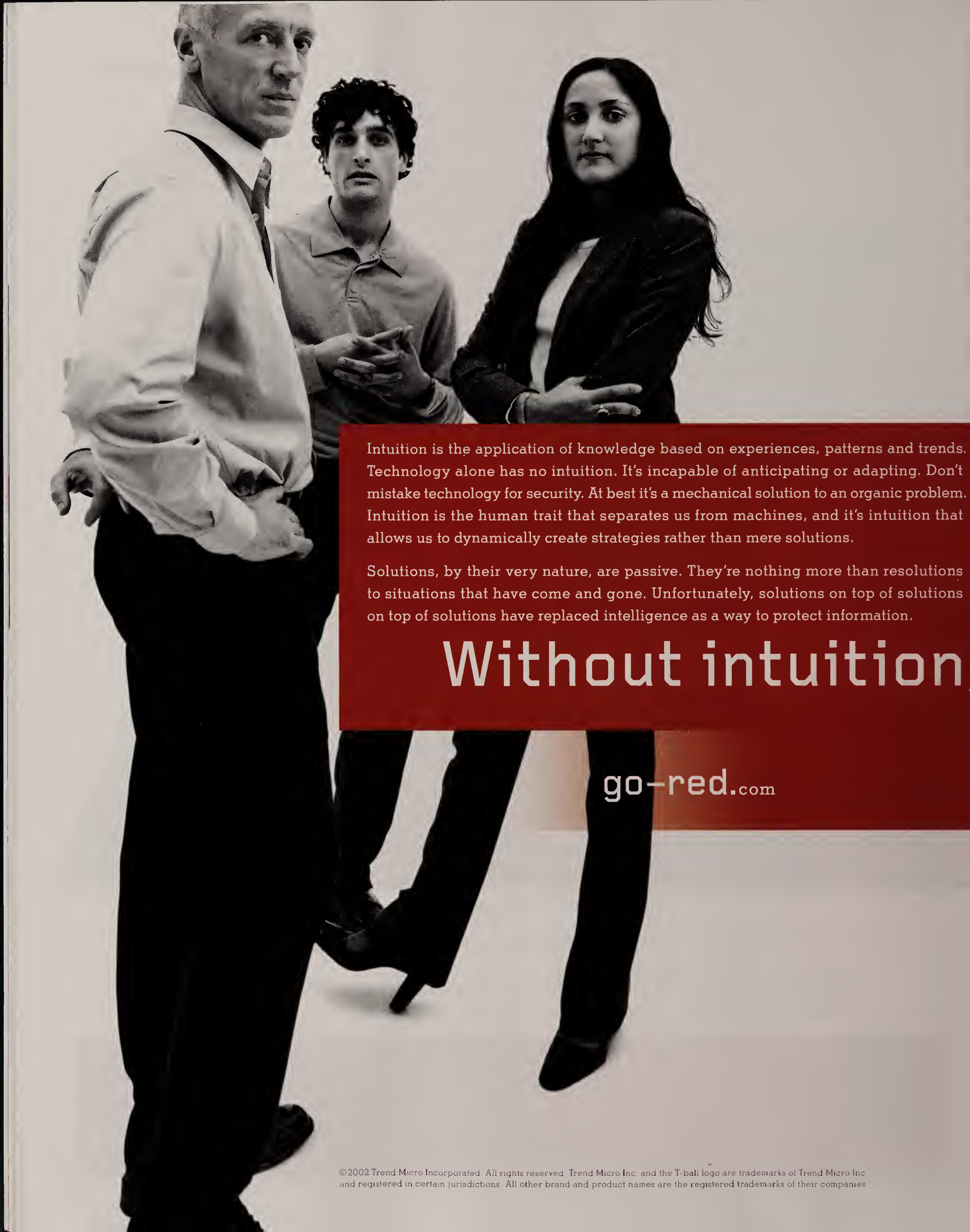
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STRATEGY IS
NOTHING WITHOUT
INTUITION.

intuitive information security



Intuition is the application of knowledge based on experiences, patterns and trends. Technology alone has no intuition. It's incapable of anticipating or adapting. Don't mistake technology for security. At best it's a mechanical solution to an organic problem. Intuition is the human trait that separates us from machines, and it's intuition that allows us to dynamically create strategies rather than mere solutions.

Solutions, by their very nature, are passive. They're nothing more than resolutions to situations that have come and gone. Unfortunately, solutions on top of solutions on top of solutions have replaced intelligence as a way to protect information.

Without intuition

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information is naked.

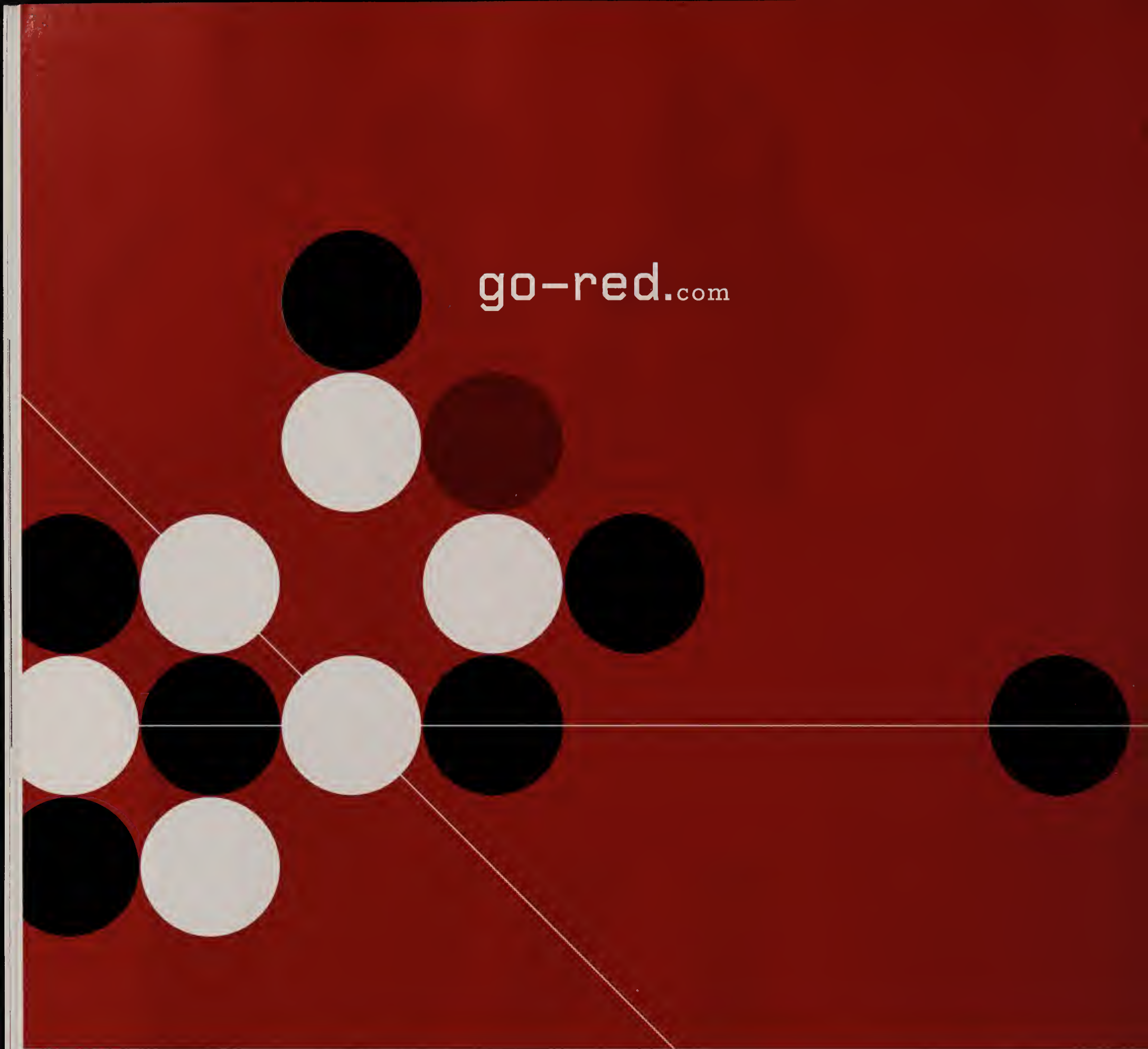
Intuition leads to innovation. Not simply to solutions, but innovative technologies able to deliver and execute intelligent strategies. Technology itself must constantly be questioned, analyzed and expanded in directions that are yet to exist. Using intuition to anticipate the future is the only way to secure information in the present.

Identifying new viruses, finding malicious code and logging security breaches are no longer enough. *Intuitive Information Security* is the melding of innovative technology and human intuition so that unique strategies can be applied to ever-changing problems. Strategies that are deployed by tools able to understand where information is vulnerable and how best to protect it. From the desktop to the file server. From the email server to the Internet gateway. From the home PC to wireless devices — everywhere there is information.

Some may not believe that this is possible. But to those who do, a new level of information security will emerge. One that is proactive rather than reactive. One that uses intuition and technology to do what was once done manually. And most important, one that allows the emphasis to change from packaged solutions to evolving, intelligent strategies.

Intuitive Information Security is as much a philosophy as it is a technology. Without intuition, information is naked. To accept this simple principle is to embrace the philosophy of go-red. And it is the basis of all of our products and services.

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CXO Perspectives

Views from the Executive Suite

Show Me the Value

Your CEO is counting on you to make sure technology investments really pay off

BY JACK BRENNAN

THERE'S A GREAT SCENE in the 1983 comedy *Trading Places* when the main character, a snooty commodities broker played by Dan Aykroyd, gets fired and is forced to pawn his expensive wristwatch.

"This is a Roche Vouceau," Aykroyd's character tells the Philadelphia pawnbroker. "The finest water-resistant watch in the world. Singularly unique, sculptured in design, handcrafted in Switzerland and water-resistant to three atmospheres. This is *the* sports watch of the '80s. \$6,955 retail!"

"You got a receipt?" the pawnbroker asks.

"It tells time simultaneously in Monte Carlo, Beverly Hills, London, Paris, Rome and Gstaad," Aykroyd replies.

"In Philadelphia," says the pawnbroker, "it's worth 50 bucks."

Philadelphia pawnshops aren't the only places where value is subject to debate. When it comes to business technology these days, companies are asking hard questions about outlays for new initiatives.

Many companies stopped asking tough questions during the tech-spending frenzy of the late 1990s. Having resigned



themselves to spending large sums on Y2K compliance, companies soon jumped on the consultant-driven bandwagon for the Internet "revolution." No one asked, "What's the return on this project?"—if they did, they were treated as bean counters with no vision.

During the last two years, we've seen the pendulum swing again. In an era of tight budgets and slower growth, technology's hottest toys aren't worth much today unless they deliver real value to the business.

Value for Whom?

From my perspective as a CEO, the operative question in assessing IT value is, Value from whose point of view? Customers, the folks in the back office and shareholders don't always have a common view of what constitutes a good technology investment.

Customers. In the eyes of your customers, any technology initiative is worthwhile if it makes your company easier and more convenient to deal with. Take the most visible manifestation of technology in business: the Web channel, where your customers come to learn about your company and buy its products and services. In the investment industry, clients clamored

Technology initiatives that are designed to meet a perceived customer or employee need must also provide value to the shareholder.

for online account access and got it, even though it might not have been in their best interest. Easy trading can tempt investors to buy and sell excessively, often turning a big nest egg into a small one.

Employees. The people who work with you define technology value differently. To them, the most worthwhile initiatives are those that make their job more interesting or free them up to perform more value-added tasks. In the investment industry, the advent of automated transaction capabilities a decade ago meant that our people no longer had to manually process every purchase, redemption or exchange. Instead, they could process by exception, focusing on transactions that required special attention.

Shareholders. Though it's important to serve the needs of customers and employees, for most companies it is the shareholder's definition of value that ultimately matters most. What's the return on the investment? Will this new initiative provide economic value by improving quality, cutting costs or increasing revenue? To justify their existence, technology initiatives that are designed to meet a perceived customer or employee need must also provide value to the shareholder.

While the shareholder's definition is the one that must carry the most weight, major technology investments should be examined from all three perspectives. To make sure that this occurs at Vanguard, we typically appoint an advocate for each point of view when we consider the business case for a major investment. Having people sit in those chairs, figuratively speaking, can be a good way to ensure disciplined thinking about value.

for analyzing the expected return on a new initiative (Vanguard happens to favor net present value), but no matter which method you use, you cannot ignore your business judgment and intuition. Basing technology spending decisions on numbers alone can be penny-wise and pound-foolish.

When we first decided to develop an online presence for Vanguard in the early 1990s, it was all based on gut instinct. We believed intuitively that online account access would enable us to reduce the costs of serving our clients—and, indeed, that later proved to be true—but at the time, we had no numbers to back that up because the Internet was so new.

The CIO and the CEO have an intuitive sense of where the shareholder value is in a given technology initiative. It's the CIO's role to ensure that the enterprise is harnessing the very best technology capabilities for its broad strategic priorities. One important question to ask when considering any major project is, Can this technology be leveraged across business segments to serve multiple needs?

It's essential to distinguish fads from substance, and here again, the CIO's business-technology perspective is invaluable. For example, news reporters not long ago were asking every investment company, When will you offer wireless trading to your clients? At Vanguard, we felt that the capability to make trades while stuck in rush-hour traffic didn't make much sense for buy-and-hold mutual fund investors. Thus, we offered wireless access to select brokerage clients through an outside vendor as an accommodation, but we put greater R&D focus on the development of analytical tools to help clients become better investors.

One assessment tool that our senior staff has come to rely on to distinguish fads from substance is the devil's advocacy session. In these gatherings, two teams rigorously debate the pros and cons of a particular course of action from multiple perspectives. Fads tend to lose their allure when subjected to such rigorous examination.

Threats to Value

Having the right value focus isn't the whole story. Companies still face three stumbling blocks on the path to effective and efficient business technology solutions.

Rushing toward a solution. The biggest pitfall in business technology decision making is probably the rush to embrace a solution without fully understanding the underlying need. Defining the problem accurately should be the first step, and here the CEO looks to the CIO to play an active role. It's important to recognize that technology isn't the solution to every problem.

Losing the focus on value. Most companies do a pretty thor-

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The Right Stuff

A fundamental rule about assessing IT value is that spreadsheets don't tell the whole story. There are multiple valuation approaches

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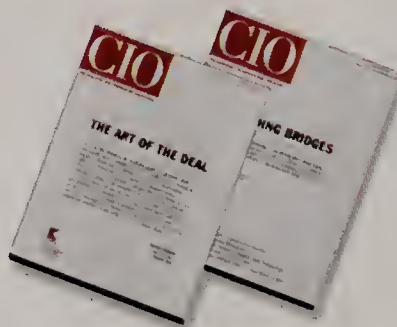
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CXO Perspectives

ough job of assessing the potential value up front, but then they may forget to keep that goal in the forefront as the project moves forward. It's important to view value in light of the development *and* ongoing costs associated with the project. And just to be very clear, staying focused and disciplined is just as much on the shoulders of the business sponsor as on the IT group. In fact, it's our view at Vanguard that the business management team should be taking the lead on business technology projects, looking to IT for facilitation but not leadership.

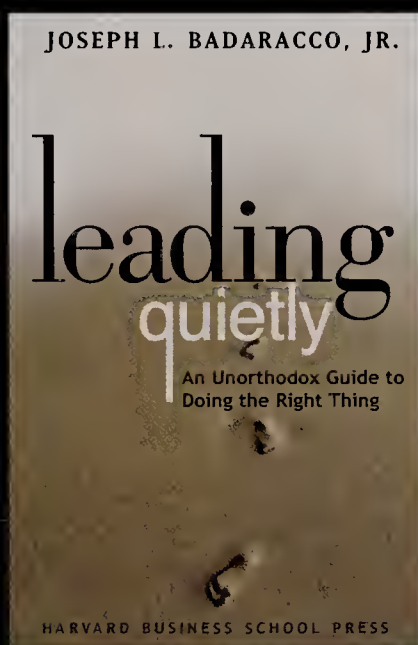
Forgetting to measure the results. No project is complete without a means for measuring how well it is delivering the value that was intended. At Vanguard, we've implemented a version of Six Sigma, and that data-driven methodology is proving to be an invaluable tool for evaluating technology initiatives. Whereas in the past we relied on anecdotal data—client e-mails, for example—to assess new website enhancements, we now look at an array of objective statistical data. For example, after enhancing the area where clients can open new accounts online, we moni-

tor how many attempts to use that feature are abandoned without being completed, and then we make improvements.

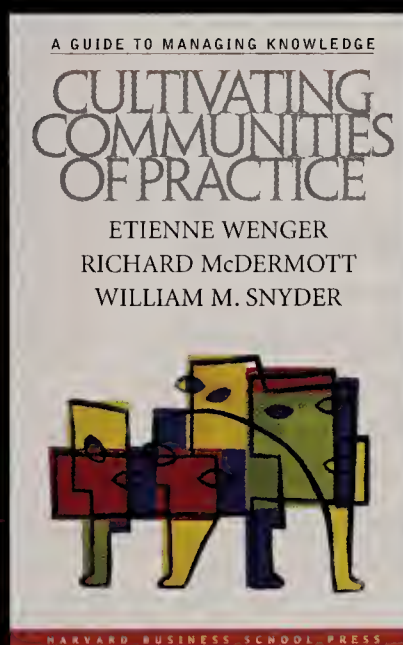
No project is complete without a means for measuring how well it is delivering the value that was intended.

It seems unimaginable to pursue business technology solutions without measuring the value provided. How else can you answer the question, What did we get for our money? In those efforts, the CIO has a pivotal role to play as the business technology leader within his company. The CEO can put shareholder value on the top of everyone's priority list, but it's the CIO who delivers IT value. Rest assured, the CEO is counting on it. **CIO**

What topic would you like to see discussed from the CEO's perspective? Let us know at cxoperspectives@cio.com. Jack Brennan is chairman and CEO for the Vanguard Group in Malvern, Pa.



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Conquering new territory is the leader's ultimate challenge. Daring thinking and focused execution are just the beginning of what's required.

BY CHRISTOPHER HOENIG

THERE IS NO greater challenge for a leader than breaking new ground. Whether it's in R&D projects, starting or acquiring new businesses, developing new partnerships or tackling new markets, the combination of high uncertainty, potentially hostile forces and unknown returns all make for an intense mix. But you won't discover that hidden gold mine by staying in familiar territory. It's a jungle out there, and the people who learn to get through it and conquer the territory are some of the greatest leaders among us.

My personality and career path have frequently put me in the position of breaking new ground, and I've got the scars to show for it. Here's the best of what I've learned over the years, both on the front lines and in the executive suite.

Envision the Destination

Long before you see the new ground, all you can do is imagine it, and that's the first and most important step. Call it vision or inspiration, but the clearer it is, the more passionate and compelling you are about it, the more likely you are to get there.

Learn the territory and set direction. The ground you're



searching for may be new, but that doesn't mean you can't get valuable intelligence early on. You can learn about the territory surrounding it, whether anyone has visited before and who else might be interested. Be sure to look at the macro and micro climates that will affect you. Critical choices will depend on knowing as much as you can.

Plan ahead—or plan to fail. Force yourself to anticipate, look ahead and prepare. The worst thing that can happen is that you'll get it wrong. If you're right, you'll be ready. Accept that you may need to change your plan four or five times before you get it right.

Choose the right people. It can be a small or large effort, into hostile or peaceful territory, under pressure or focused on the long term. But the constant that determines success or failure is the attitude and quality of your team. If you've got a core of handpicked, competent and committed people, your

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odds of success go up. If you don't, a negative outcome is almost predetermined.

Think big enough. Small territories are not only easily washed out, they're unsustainable and easy to take over. From the very beginning, you've got to be thinking about the manageable territory you want to work and be planning to scale up to it. Scaling is very difficult, and the need for speed adds to the degree of difficulty. It affects your choice of people and tools as well as your need for resources. There is no magic formula for choosing the right size, but it never hurts to find out how big your competitors are and make your first goal getting to their size.

Define the value. You may be after gold, thinking that its value is a certainty. But only the market makes it so, and the market can change quickly. If you're looking for a new material altogether, then be prepared for a tough slog in convincing

you've found something worthwhile, make your claim quickly. But do it quietly. Unless you're in the upward swing of a dot-comlike economic bubble, creating buzz doesn't do anything except alert potential predators. The process of protecting your claim can also push your thinking and enhance innovation. In my most recent commercial venture, formulating a good patent application—where quality is measured by your ability to teach another professional how to build what you've invented—pushed us to a whole new level of quality in our product design.

Know your neighbors. Once you find a place with some value, you'll need to quickly assess the neighborhood. The people and companies closest to the space you occupy will be the ones you'll have to coexist with, ally with or fend off. Watch out for partners of convenience. Better to choose a partner once you've really determined what it is you're going to do.

Bank your winnings. As you achieve victories and recover resources, bank your winnings and create a safety net. Don't count on hitting any of your targets precisely. Make sure you're prepared so that if things slow down or unexpected events occur, you aren't forced to give up your claim.

As soon as you've found something worthwhile, make your claim quickly. But do it quietly.

people of its worth. You'll need a working example for which an objective third party can independently verify meaningful, bottom-line net benefit.

Expect some dry holes. Very few are lucky enough to find a vein of ore, break ground and tap into pure material right away. Some of the biggest gushers came from areas that others thought were worthless because they didn't drill enough holes. You've got to be able to tolerate setbacks. It took the founders of Intel dozens of rejections before they got their first capital investment.

Watch your back. Sometimes you can break new ground in secret. But in general, there's always someone watching for the payoff—to steal it if you succeed and to point to you if there's a failure. So watch your back, and have others watch it for you too.

Stake Your Claim

Once you've found a place with promise, you've not only got to mine it, you've got to protect it at the same time.

Know your extraction strategy. You may have a small vein that is easy to access quickly or a deep, large vein that takes more investment and time to exploit. Whether you learn this early through analysis or only through actual digging, it will determine your overall effectiveness.

Be quiet. For a patent, trademark, publication or other means of staking a claim, the general rule is that as soon as

Take it step-by-step. Remember that breaking new and valuable ground combines daring thinking with diligent, disciplined, step-by-step execution. Manage your risks down. Take opportunities that come along. But stay focused on what you're doing now and what your next step will be. Too much focus ahead or too much hindsight, and you may trip and fall.

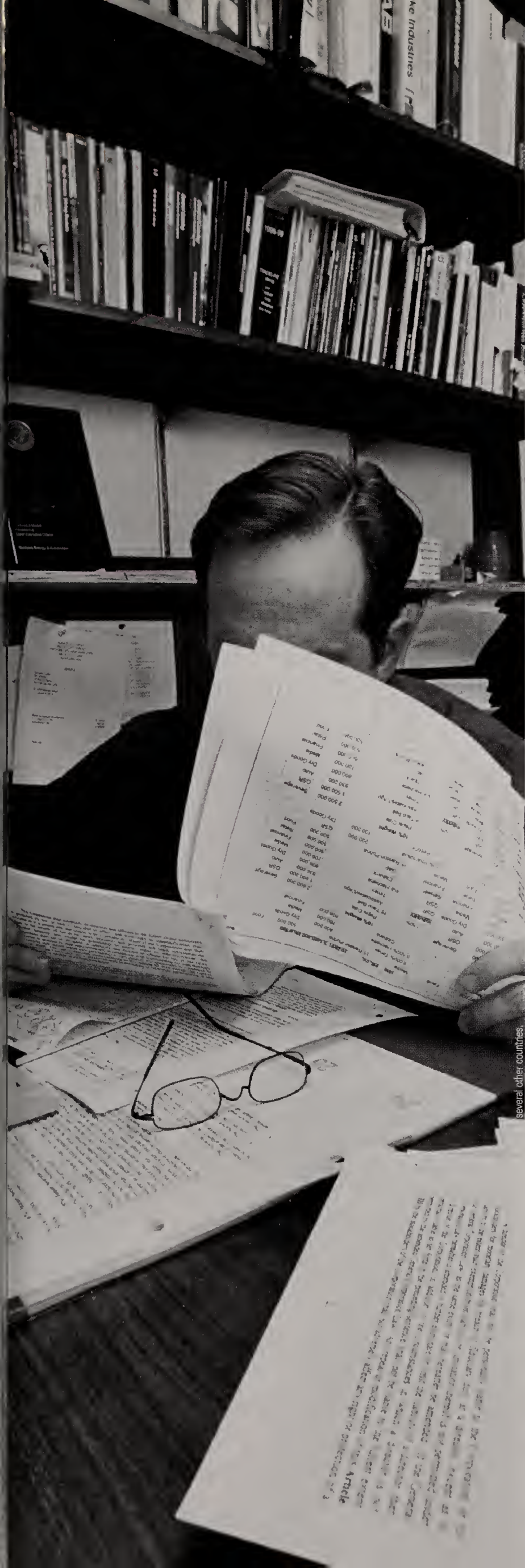
Know when to stand your ground. If you're lucky enough to develop a new territory, you won't be lonely for long. Others will beg, borrow, copy or steal to get into your space. You'll have to decide whether to fight or move on.

The rewards of breaking new ground are generally uncertain, but the risks are guaranteed. So as a leader, identify the mistakes others have made. Find your central purpose so that you're not disturbed by the ups and downs of the environment. And find your colleagues. The more you reach out and get resources and people involved, the more likely you are to lead your way into your own little gold rush. **CIO**

What do you think it takes to break new ground? Let us know at leadership@cio.com. Christopher Hoenig has been an entrepreneur (CEO of Exolve), consultant (McKinsey & Co.) and inventor, and is the author of *The Problem Solving Journey: Your Guide to Making Decisions and Getting Results* (Perseus Publishing, 2000). He is now director of strategic issues for the General Accounting Office.



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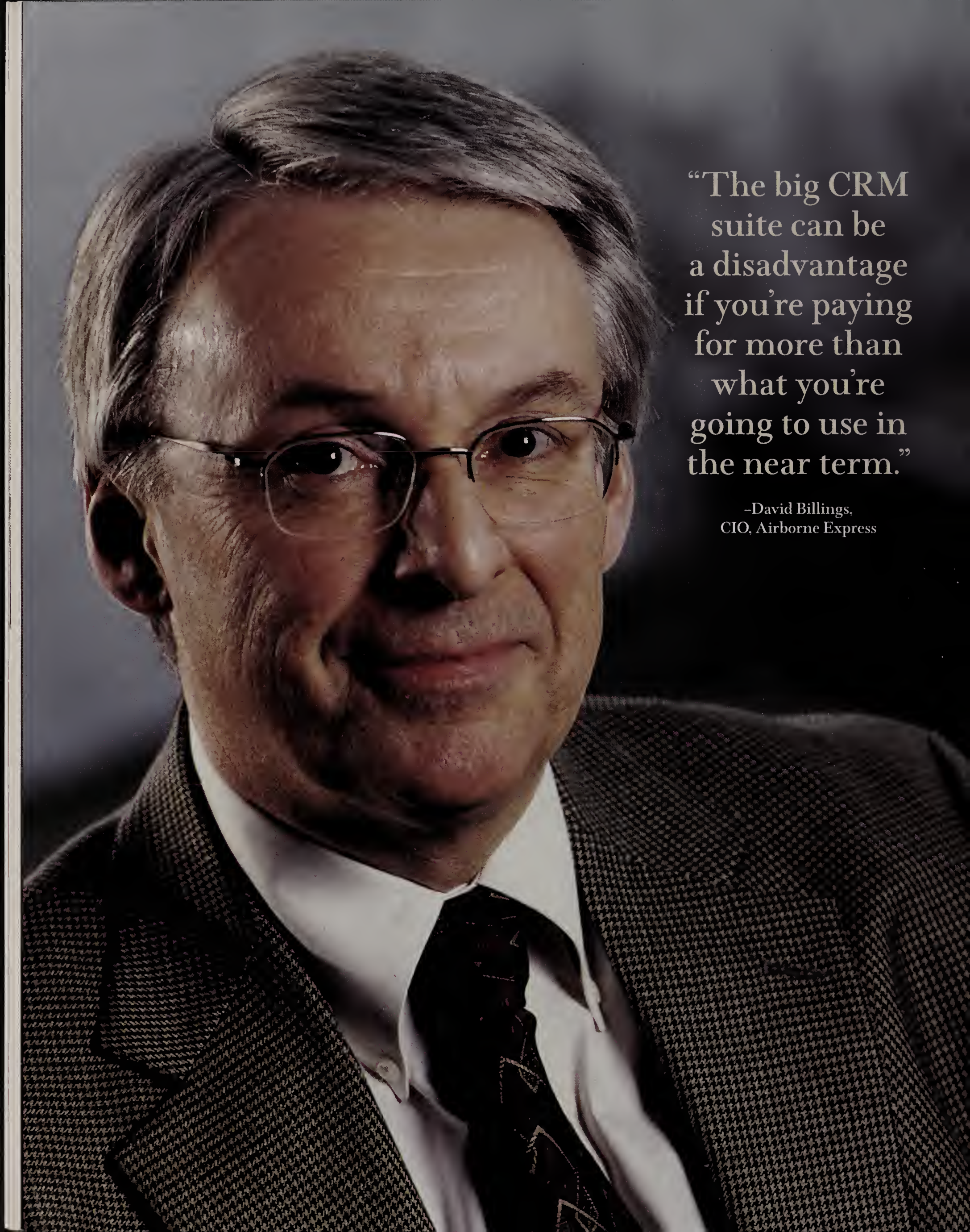




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A close-up portrait of David Billings, a middle-aged man with short, graying hair and glasses. He is wearing a dark, patterned suit jacket over a white shirt and a dark tie. He is looking directly at the camera with a slight smile. The background is dark and out of focus.

“The big CRM
suite can be
a disadvantage
if you’re paying
for more than
what you’re
going to use in
the near term.”

-David Billings,
CIO, Airborne Express

As the economy cuts into CRM spending, companies are looking for ways to move ahead without breaking the bank

BY SUSANNAH PATTON

Get the CRM You Need at the Price You Want

Reader ROI

- ▶ See why a small-step implementation adds up to big ROI
- ▶ Learn why patching together different software solutions can work
- ▶ Find out when outsourced models may be the answer

David Billings, senior vice president and CIO at Airborne Express, didn't plan on skimping when he set out to replace the company's 5-year-old sales-force automation system. But as he surveyed the vendors at the beginning of the project a year and a half ago, he realized that cost would play a part in the selection. Billings ended up with just what his Seattle-based com-

pany needed: a targeted sales-force automation package from Onyx Software, a midsize CRM vendor, for \$3 million—half of what he says he would have paid for a full CRM suite from a market leader. What's more, Billings implemented the new sales-force automation package in only six months.

Until recently, the term *customer relationship management* was buzzing around every corporate executive's suite as the IT panacea that could transform a company from

laggard to trendsetter by boosting customer loyalty, sales figures and, ultimately, profits. Then the worrisome reports started to trickle in: Most CRM projects, dogged by poor planning and user resistance, were not producing measurable benefits. Costs were sky-high, with major corporations shelling out anywhere from \$60 million to \$90 million for large-scale CRM implementations. CIOs were clearly getting burned. (See "The Truth About CRM," at www.cio.com/printlinks.)

Then an interesting thing happened. The booming CRM market of yore started to exhibit signs of strain. Independent CRM software vendors showed a 15.7 percent drop in third-quarter revenues in 2001, according to Boston-based consultancy Aberdeen Group. And Stamford, Conn.-based Gartner predicts that CRM spending will remain flat in 2002 after falling 8 percent in 2001 (that's compared with growth of 89 percent in 2000). Gartner does expect spending on CRM software to rebound by 10 percent—but not until 2003.

Sounds like companies are pulling the plug on their CRM projects. But that's not the case. According to a recent *CIO* exclusive survey, "CRM: Are Companies Buying It?" companies such as Airborne Express have just learned to implement such projects in easy-to-take baby steps (64 percent) rather than in one scary giant step (only 36 percent). (Find the full survey results at www2.cio.com/research.)

As the economy officially dipped into recession and IT spending came under increased scrutiny, the scaled-down CRM project was seen to provide a quicker path to ROI. And the new trimmer version doesn't have to break the bank to be successful. Like Billings, most CIOs are going with more targeted, incremental CRM investments. Others are taking the chance and patching different systems together when it saves money. And a few are turning to outsourced, hosted services that provide customer-facing technologies. All three strategies work to the same end: providing fast CRM relief with equally fast ROI.

Step by Step

AIRBORNE EXPRESS'S EXPERIENCE REFLECTS A CAUTION THAT MANY CIOs are displaying when it comes to dealing with expensive and expansive IT projects. "Some of those solutions are more comprehensive, and that can be an advantage," says Billings. "But it can also be a disadvantage if you're paying for more than what you're going



David Henderson, chief marketing officer for Group Health (above), has seen his company go from basic technology to implementing a successful slice of CRM in two short years.

to use in the near term."

Sentiments like that have not gone unnoticed by the big-name vendors. Oracle, PeopleSoft, SAP and Siebel Systems are reacting to buyers' scaled-down demands. Barton Goldenberg, president and founder of ISM, a CRM consulting company headquartered in Bethesda, Md., recounts the story of a bidding war between Siebel and another vendor. The vendor, whose software is considered best in class, "offered a bid of \$650,000 for a package that only covered marketing and sales-force automation," says Goldenberg. "Siebel came in with \$1.6 million for their integrated CRM suite." When the battle looked lost, however, Siebel came back with a more targeted version at a better price—and won the contract. And that's how things are going to be "for the next six to 12 months," says Goldenberg.



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For example, Group Health, a nonprofit health insurance company based in New York City, has gone from very basic technology in its 100-member sales department to implementing a successful slice of CRM in two short years. Last year, it implemented Siebel's sales-force automation software in three months, for an initial cost of about \$500,000.

Now Group Health is working on implementing Siebel software that automates the RFP process. Though future modules have been planned, the company is holding off on further investments for the moment because of concerns about the economy. "It will be more difficult to get financing of other modules and more difficult to justify [them] through ROI," says David Henderson, the company's senior vice president and chief marketing officer, who worked with the IT and sales departments to choose the CRM technology.

According to Steve Mankoff, Siebel's senior vice president of technical services, Siebel customers are looking for "quick win" solutions. Mankoff maintains that Siebel, the current CRM software leader, has encouraged a phased approach to implementation from the beginning and is now seeing more of a focus on ROI. For its part, Oracle is offering subscription and nonsubscription services over the Web for customers who want a cheaper, faster CRM fix. "The goal is to offer customers lots of options through both online and conventional implementations, and to get it up and running quickly," says Lisa Arthur, Oracle's vice president for CRM marketing. She concedes, however, that "You can't do all of CRM quickly."

But "all of CRM" is not the goal for many companies. International Speedway, the Daytona Beach, Fla., company that sponsors Nascar and other motor races at 12 venues around the country, took a targeted, slower track to CRM. When Craig Neeb joined the company as its first CIO two years ago, he immediately focused on areas that were key to boosting revenue: installing ticketing systems, and promoting sales and merchandise over the Internet. Neeb looked at a wide array of CRM vendors and chose Vertical Alliance

to rebuild the company's website and set up a fan loyalty program. The budget for software, re-architecture and implementation, which took about two months, came to \$1.5 million for International Speedway, which has annual revenues of roughly \$500 million. "You have to find the best fit for your immediate objectives," Neeb says. "We have a fairly simple operation. Why add complexity? Our

plan is to move slowly and add to the system over time."

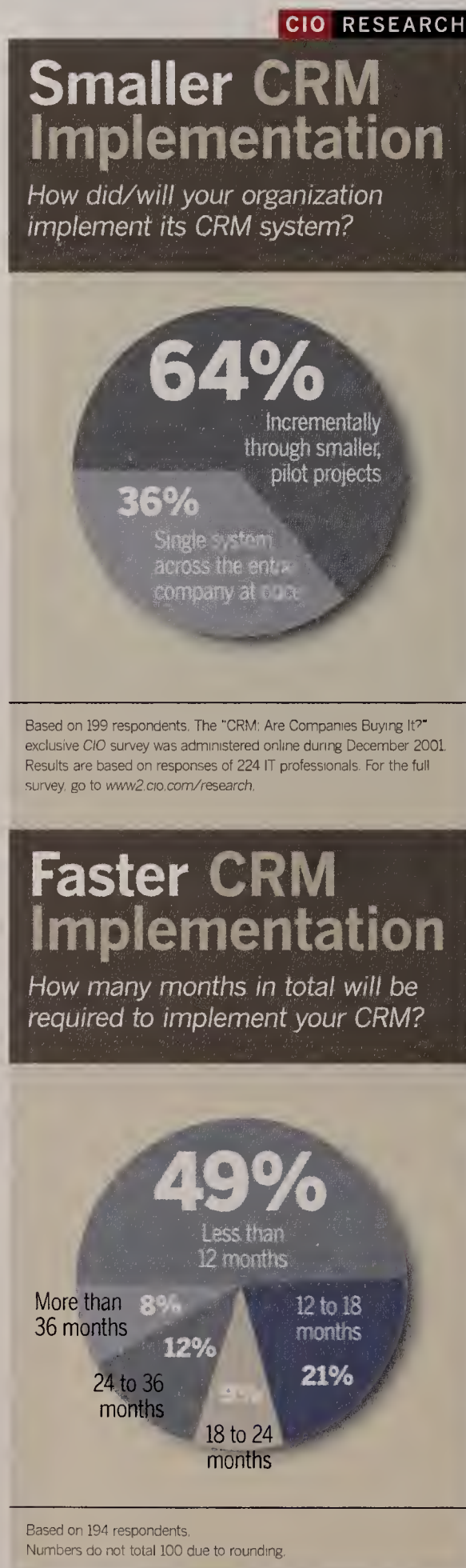
Adam Honig, president of Akibia Consulting, a Westborough, Mass.-based consultancy that specializes in CRM, says companies should focus on quick wins: Analyze their situation for two weeks and then implement a small piece of a package. Then, they need to establish ROI before they can move on. "We've always looked at CRM as small, tactical and progressive," says Honig. "The 18- to 24-month implementations are a myth created by the large consulting firms."

Patching Things Together

COMPANIES ARE OFTEN FINDING THAT NO one CRM vendor can address all their customer-related needs. They're willing to take on the headaches of patching systems together to get exactly what they want.

When FedEx bought the transportation company RPS in January 1998 and set out to merge the sales and IT departments, Scot Struminger, a vice president of IT for corporate headquarter systems at FedEx Services in Memphis, Tenn., started looking for a sales-force automation system that he could install quickly for the company's 2,000 salespeople. He selected CRM vendor Youcentric (recently bought by J.D. Edwards) primarily because he wanted to save time and money. While packaged CRM applications often require companies to load and maintain customer data within the application, Struminger notes, Youcentric and some other, more flexible vendors let customers plug in to preexisting back-end databases. The result, he says, is that companies can save money because they don't have to build a brand-new data mart, as they do with some of the larger CRM vendors.

FedEx Services is in the process of inte-



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*Best Practices for Mobile Workforce Information Backup,
John Girard, Gartner Research, QA, Dec 2001*



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grating its sales-force automation application with its PeopleSoft ERP system, a sales compensation application from Trilogy and call center software from Clarify, all using Tibco software to pass information among the different packages. "We decided to go with multiple vendors in order to find the best in each area," Struminger says. "Piece by piece, we have implemented them all gradually."

In FedEx's case, patching together software from different vendors has helped avoid major problems. For example, when FedEx Services first implemented its Youcentric CRM system, the company underestimated the difficulties some field reps would have in accessing the Web-based system. Struminger and his team were able to modify the system by making changes to the server during a weekend. If FedEx had installed CRM software on all the laptops, "it would have been a costly nightmare," he says, noting that larger CRM

packages he had looked at required that type of installation.

Denis Pombriant, research director in CRM at Aberdeen Group, calls this modular approach to CRM the wave of the future. For example, if a company chooses a vendor that uses Java architecture, it can also develop Beans (reusable software components written in Java that can be used by a Java development environment) that will integrate into a legacy system. "In this way, it's entirely possible to mix multiple vendors," Pombriant says. "I call this 'best of breed on steroids.'"

CRM for Rent

FOR THOSE WHO DON'T MIND FORGOING THE ABILITY TO CUSTOMIZE CRM applications, or for small companies that need only a targeted application such as sales-force automation, ASPs can be an

alternative to putting off CRM ambitions. Vendors such as 3-year-old Salesforce.com and 4-year-old Upshot offer rented CRM applications, with a focus on sales-force automation that can be less expensive than what a major CRM vendor would charge for a year. Such nipping at the heels has prompted the top dogs, such as Oracle, PeopleSoft and Siebel, to also offer outsourced CRM packages. For those who need more personalization and control, there is the managed service provider (MSP), such as Wheelhouse, which offers consulting services and some customization in addition to a hosted application. Consulting companies such as Cap Gemini Ernst & Young and IBM Global Services also offer MSP CRM packages. (CIO's publisher, CXO Media, holds an investment stake in Salesforce.com and Wheelhouse.)

Rodric O'Connor, CTO at San Francisco-based investment bank Putnam Lovell Securities, decided to take the risk of going with an ASP. The economy wasn't yet in retreat in early 2000, and Putnam Lovell was still growing. O'Connor had to decide whether to add to his six-person IT staff in order to build a bigger infrastructure and maintain complicated software installations. As the boutique bank grew, IT requirements were starting to become unwieldy. Nine separate databases held customer information, and each division had its own contact records. "It was a nightmare, and there was pain involved," O'Connor says. Customers were routinely receiving duplicate research

"We have a fairly simple operation. Why add complexity? Our plan is to move slowly and add to the system over time."

—Craig Neeb, CIO, International Speedway





chaos or complex system?



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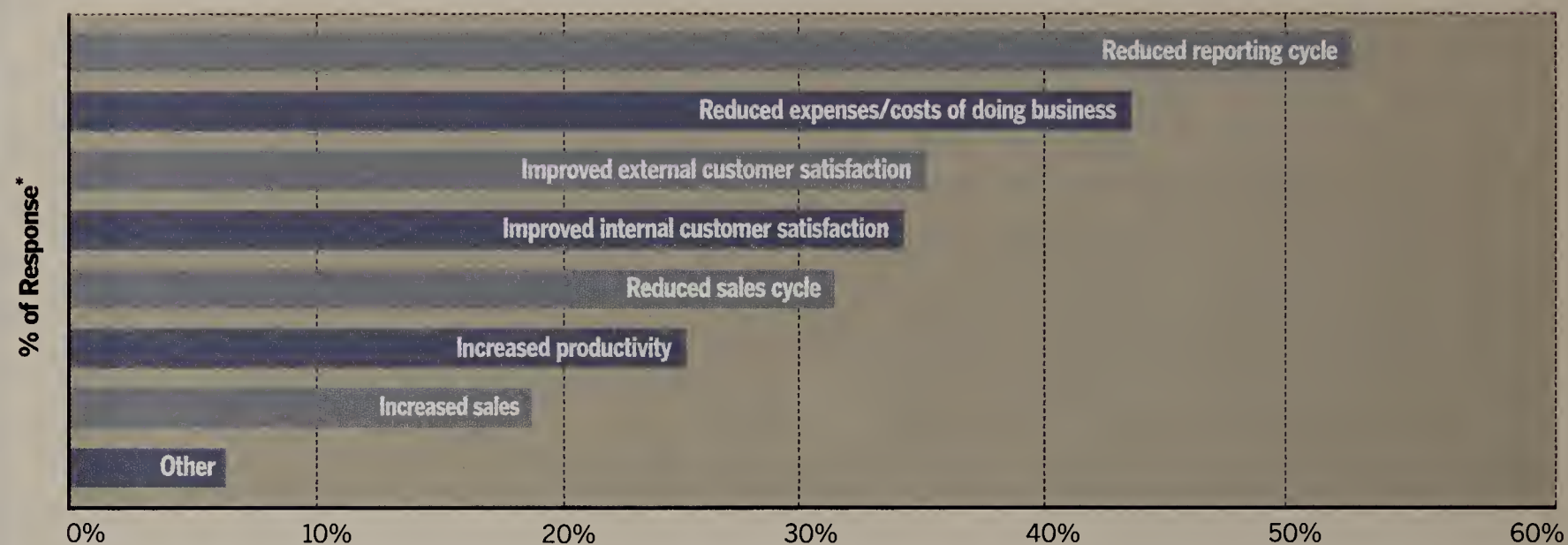
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What You Want

How will your organization measure the ROI or value of its CRM implementation?



*Based on 173 respondents. The "CRM: Are Companies Buying It?" exclusive CIO survey was administered online during December 2001. Results are based on responses of 224 IT professionals. For the full survey, go to www2.cio.com/research.

reports, even holiday cards—or none at all. O'Connor looked at vendors including Siebel and Onyx, but he decided outlays of up to \$2 million were too much to swallow for a small bank, even with its expected growth.

"We were close to going with one of those vendors but were concerned about ROI," O'Connor says. Instead, Putnam Lovell signed on with Salesforce.com, which charges a set subscription fee of \$65 per user, per month. The ASP's sales-force automation application created a single database and allows 134 users at the bank to track client relationships by sending out e-mails automatically and automating the delivery of research to clients. O'Connor says the client research mechanism is saving the company \$200,000 a quarter and, according to his calculations, outsourcing has reduced the total cost of ownership by 57 percent.

Despite the cost advantages, many shy away from ASPs because they fear the consequences to their business if the hosting company shuts down. O'Connor combats that worry by regularly speaking directly to Salesforce.com's CFO. Hosted CRM software also suffers from a lack of customization capability, as well as integration problems. However, some of those integration difficulties are getting resolved as ASPs come out with XML interfaces that allow users to pump data from one outsourced application to another. Still, companies need to look carefully at how

much customization they will require when deciding to outsource a CRM application. "When the scope is limited, a hosted ASP model is quite good," says Jocelyn Young, program manager for CRM services at Framingham, Mass.-based IDC (a sister company to CXO Media). "But if a company wants a more comprehensive solution that would allow for the integration of customer data with marketing campaigns, then an MSP model might be more effective."

Kevin Scott, an analyst at Boston-based AMR Research, adds that while ASPs aren't the right choice for all companies—if you have more than 1,000 users, such solutions may not be scalable—they could be a good option for a division head who wants to get a project up and running quickly. Using an ASP, he says, doesn't preclude investing in a CRM software package when the economy picks up. "Is it worth it to do a cheaper, rented application for a year then throw it away?" Scott says. "In some cases, it's not a completely wrong choice to make."

As O'Connor and Airborne Express's Billings found out, CIOs are now in the CRM driver's seat. Implementations can be shorter term and relatively painless. What's more, as O'Connor says, "CRM doesn't have to be expensive." **CIO**

Senior Writer Susannah Patton would like to hear how you're taming the CRM beast. E-mail her at spatton@cio.com.

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For the complete results of our **CRM: ARE COMPANIES BUYING IT?** survey, go to www2.cio.com/research.

STRATEGIC DIRECTIONS



The Secure Enterprise

INSURING SURVIVABILITY AND CONTINUITY

WHAT'S INSIDE:

WELCOME TO THE UNBOUNDED NETWORK p.4

COUNTERMEASURES TO PROTECT THE ENTERPRISE p.8

STAYING ALIVE: BUSINESS CONTINUITY PLANNING p.20

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THE SECURE ENTERPRISE

ENSURING SURVIVABILITY AND CONTINUITY

AS WE'VE ALL LEARNED TOO WELL FROM SEPTEMBER 11, staying secure requires constant vigilance. The threats we face are myriad; they come from mundane mistakes as well as malicious intent, from inevitable equipment failure and service provider disruptions to less probable natural disasters and terrorist attacks.

The challenge for CIOs: to stand always prepared in a competitive context which increasingly demands that organizations provide continuous business services and information systems and networks that are always on, 24x7x365. Thus, notes Gartner researchers, when significant system outages *do* occur — whatever the cause — the typical organization has from two to 24 hours to recover.

This means that an enterprise's essential services and assets must return to at least a minimum functionality — or else the enterprise simply cannot do business. Such a demanding requirement entails:

FENDING OFF ATTACKS. Organizations need to implement an assortment of hardening techniques — among them virtual private networks (VPNs), firewalls, encryption — in addition to operating system/application/data backup, strong authentication and access control, constant system and application updating, and solid configuration management.

SPOTTING INTRUSIONS AND CONTAINING THE DAMAGE. Organizations need tools to help them monitor sys-

tems and networks, scan for viruses, identify intrusion patterns and data anomalies, and conduct integrity checking and regular audits.

RESTORING SERVICES AFTER A FAILURE OR ATTACK. Organizations need to develop operational procedures that isolate damage and recover system configurations, applications and data. This involves building and taking advantage of system redundancies, and using offsite backup facilities (hotsites and/or coldsites.) Sometimes

WHEN SIGNIFICANT OUTAGES DO OCCUR, THE TYPICAL ORGANIZATION HAS FROM TWO TO 24 HOURS TO RECOVER.

full services cannot be quickly restored; an alternative (read: better than nothing) is to operate with abridged services or to a subset of the user base.

LEARNING FROM THE PAST. Every accident, disaster, attack and intrusion has something to teach and offers insight into what an organization can do better to avoid future catastrophe. Post-mortems can help identify and put to work new ways to filter data, new patterns that signal anomalies, new data elements that should be logged and audited, new procedures that improve response.

This *CIO Strategic Directions* supplement explores the many powerful technologies, products and services that can help enterprises prevent, resist, and recover from the events we all hope will not occur but can never afford to disregard. **SD**

WELCOME TO THE UNBOUNDED NETWORK

IN ITS 2001 SURVEY OF MORE THAN 1,000 IS managers, Computer Sciences Corp. found that nearly 90 percent of those queried were shepherding new system development initiatives. No fewer than 85 percent of these efforts involved using the Internet, that unbounded public network to which *anyone* has access.

The risks inherent in letting anyone on the Internet into corporate IT sanctums are, of course, profound: mostly it's about loss — of revenue and profit, productivity, sensitive information, reputation, customer confidence and loyalty.

CAUGHT IN THE BREACH

Nor is the risk just theoretical. Fully 85 percent of those participating in the 2001 Computer Security Institute (CSI)/FBI survey suffered security breaches; the average reported loss was around \$2 million. Meanwhile, the number of security incidents — including website attacks, malicious viruses and network intrusions — reported to Carnegie Mellon University's CERT (Computer Emergency Response Team) Coordination Center jumped 200 percent from 2000 to 2001, topping 52,000. The number of security

vulnerabilities in hardware and software exploded, too — from 1,090 in 2000 to 2,437 in 2001. And according to a review by the U.S. General Services Administration, during 2000 outsiders broke into and temporarily controlled at least 155 computer systems at 32 federal agencies.

Still, most computer crimes — even those involving tens of millions of dollars

to go: 46 percent of those polled have no formal information security policy, 59 percent have no formal compliance program to support their IT operations and 68 percent do not regularly conduct security risk analyses or track their security status.

WEAK AUTHENTICATION TOOLS. Tools like automated password-guessing software, easily available on the Web, make it sim-

THE RISKS INHERENT IN LETTING ANYONE ON THE INTERNET INTO CORPORATE IT SANCTUMS ARE ABOUT LOSS — OF REVENUE, PRODUCTIVITY, AND REPUTATION.

— don't get reported at all, since nobody wants to upset stockholders and customers. Only 36 percent of the companies queried in the CSI/FBI survey that suffered security breaches reported the crimes to law enforcement authorities.

THE STRUGGLE TO STAY AHEAD

Major problems and weak spots include: **LACK OF CORPORATE OVERSIGHT.** Security audits and evaluations often are too shallow, so major vulnerabilities may not be spotted. If Computer Sciences' research is any hint, we've got a long way

ple for even inexperienced bad guys to bypass authentication procedures by stealing passwords.

VULNERABLE OPERATING SYSTEMS. Because manually tightening down an OS is so tedious and time-consuming, intruders can exploit defaults and issue commands that grant them privileges reserved for system administrators — including accessing other servers and an ability to examine files, installing 'back doors' that enable easy entry in the future and altering system logs so they can remain undetected. Meanwhile,

assumed identity

Do we assume that someone is who he or she says they are, just because they wear a badge? Identity theft has created the need for a new security paradigm that focuses less on barriers than on the people within them. Identix has combined biometrics with a sophisticated identity management platform to ensure a *Continuity of Authentication*.™ What that means is positive verification of an individual's identity, not just when a facility is entered but whenever networks or information are accessed or transactions are conducted or processed. That way we can always know who's who and what's what. And assume nothing. To learn more please visit us at identix.com or call 888.433.6849.

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THE SECURE ENTERPRISE | UNBOUNDED NETWORK

new operating systems holes are being found constantly; each month brings discovery of roughly 10 new Windows vulnerabilities.

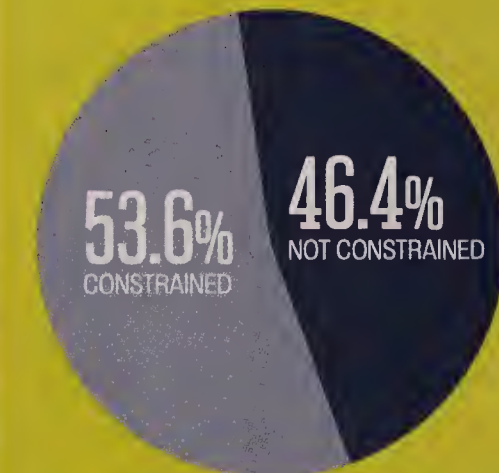
POROUS SERVERS. Servers that allow network traffic to move too freely make it easy for intruders to gain access and for malicious code to infect systems. A survey of more than 2,500 information security officers conducted last summer by *Information Security* magazine reveals that the number of attacks on Web servers doubled between 2000 and 2001, while buffer-overflow attacks increased 33 percent.

WIRELESS WOES. Can wireless encryption protocols stand up to creative attackers like those who do 'war-driving' on roads around corporate campuses with listening devices that intercept wireless transmissions?

INTRUSION MADE EASY. Penetration toolkits available on the Web automate

SECURITY ISSUES

Organization is Constrained from Pursuing E-business Opportunities Due to Security Issues



- 1,009 IS managers from 31 countries surveyed
- Follow-up study conducted late September, 2001; 56 CIOs surveyed

SOURCE: Computer Sciences Corp. [www.csc.com]
14th annual survey of IS management issues,
2001 Critical Issues of Information Systems Management

the processes of intrusion, so the inexperienced can join the ranks of cyber-raiders. Meanwhile, virus and worm

attacks are sneakier than ever. A virus can, for example, exploit the Web's Secure Sockets Layer (SSL): since proxy servers can't scan SSL-encrypted downloads for viruses, only desktop anti-virus defenses remain — but this means all desktop systems in an organization must always be up-to-date.

WHAT'S A CIO TO DO?

"First, analyze risks," suggests Richard Hunter, vice president of security research at Gartner. "All systems and data are not equal. Put the heaviest protection on the stuff that matters most. Ensure ongoing maintenance of security software and operating system patches. Hire capable security administrators, and monitor activity inside and outside the firewall to ensure that the firewall is working as desired. If this is too much for your company to handle, outsource the job." **SD**

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foundation for automating complex business processes, the system enables an organization to prepare for, work through, and return from a crisis situation. It prepares the organization by providing a means to automate its disaster plan and simulate threats to the infrastructure, with full audit capability. During a crisis situation the system provides a centralized command and control console and sophisticated communications that facilitate the quick assembly of response teams. Although Crisis Response System is not a replacement for people making decisions, it allows decisions to be made and actions to be taken faster, more efficiently, more effectively, and with better information and tracking.



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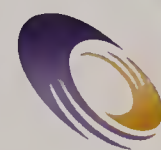
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COUNTERMEASURES TO PROTECT THE ENTERPRISE

SECURITY IS NOT SOMETHING you buy, nor is it a destination — it is an ongoing process,” advises Mike Rasmussen, senior analyst with Giga Information Group. “You cannot go out and buy a magic formula or product that will make you secure.

It takes ongoing effort.”

Certainly, however, buying security products and services have their place. International Data Corp. estimates that worldwide spending on IT security software, hardware and services will top \$35 billion by 2004.

“In order to protect against loss of assets and prevent business interruption,” says Frank Huerta, president and CEO of Recourse Technologies, “CIOs and information security professionals need two critical tools: time and information.” These, believes Huerta, can be gotten with “a layered approach to infrastructure security which permeates the organization.”

Julia Allen, a senior technical staffer at Carnegie Mellon University’s CERT Coordination Center, says these layers — also referred to as defense in depth — include:

- Eliminating known vulnerabilities; applying patches; deploying secure configurations

- Characterizing and regularly checking integrity of critical assets

- Using firewalls, access control, user authentication, and encryption technologies

- Using network and system monitoring tools including intrusion detection

- Periodically conducting vulnerability and penetration testing; acting on the results

- Using virus detection and eradication software; keeping signatures up to date

- Conducting ongoing training for users, administrators, and managers

crack a password is time. Given enough attempts at the combination an attacker will succeed. Two-factor authentication — based on something you know and something you have — is a better alternative for many applications.”

It’s not hard to see why. Last year more than 750,000 identities were stolen. When identity theft can be laid at the door of a particular organization, its reputation suffers great harm and liability can be vast.

Then there’s the matter of fraud. Research indicates that more than half

SECURITY IS NOT SOMETHING YOU BUY, NOR IS IT A DESTINATION — IT IS AN ONGOING PROCESS. IT TAKES ONGOING EFFORT.

- Having security policies and procedures that are visible, communicated, enforced, maintained and which carry consequences for non-compliance

AUTHENTICATION & AUTHORIZATION: BEYOND PASSWORDS

The most common way to identify individual users — a unique username coupled with a password — can also be alarmingly ineffective.

“Passwords,” says Giga’s Rasmussen, “are not secure. All that’s needed to

of consumers regard any financial transaction online to be unsafe. Little wonder: Internet fraud, some say, will hit \$15 billion by 2005.

The struggle to effectively authenticate those involved in online financial transactions has produced online chargeback rates that are four times greater than offline rates. Online merchants pay as much as seven times more than offline merchants in preauthorization charges. And while just two percent of credit card volume comes from

CASE STUDY

NEUSTAR'S .BIZ SECURITY BEHIND EAL4 FIREWALL

A

SSURANCE, INSURANCE AND PROTECTION ARE THE three essential elements any truly secure organization must address according to Paul L. Greene, Director of Information Security at NeuStar, Inc.

"You must be able to give assurances to the business that all essential systems will be available, you must provide insurance in the form of redundant systems and facilities and you must work hard everyday protecting the organization's assets from attacks," he explains. "No one is immune from compromise."

Greene's belief in the necessity of this security triad comes from many years' work within several classified areas of governmental agencies. Not surprisingly, Greene has brought this same focus on what it takes to create and manage a secure infrastructure to his position at NeuStar.

The only third-party vendor licensed by the FCC, Washington DC-based NeuStar operates the authoritative registry of all North American telephone numbers and administers the database, which all North American carriers rely upon to route billions of telephone calls daily. Over 4000 telecommunications and service providers currently rely on NeuStar's services. NeuStar also operates the dot-US registry, "America's Internet Address." NeuLevel, NeuStar's subsidiary, operates the .BIZ registry, the world's first top-level domain dedicated exclusively to business.

CYBERGUARD FROM DAILY ATTACKS

The addition of .BIZ opened NeuStar to the Internet in a new way, creating both business opportunity and security issues. First on the security list, says Greene, was to find a security provider for the protection piece of the security triad who was also a partner. After putting some 12 firewall vendors through their paces, Greene and his experienced team of security professionals chose CyberGuard.

"NeuStar's unique service and position in the telecommunications industry makes it a target of attacks — we have numerous attempts a day," reports Greene. "We need 'rock solid' security and a vendor who understands what that means. CyberGuard was the first in the world to achieve EAL4 certification for its firewall appliances — that really impressed us."



CyberGuard's KS series of premium appliance firewalls maintain complete separation of network traffic from system components.

"We felt confident in choosing CyberGuard to be our security partner for our .BIZ initiative," adds Greene. "We knew they would be capable of providing the level of sophisticated security support we needed and we have not been disappointed — their technical support team knows security and CyberGuard's ability to deliver on everything they promised enabled us to meet our tight deadline for deliverables. Today, we have CyberGuard's firewall appliances in three countries."

WHAT OF PERFORMANCE AND EASE OF USE?

"I have an experienced team, but on more than one occasion I had to enlist the help of a junior engineer to install the firewall," recalls Greene. "Amazingly, I was able to talk them through the process over the phone. I'm happy to report that those systems have been functioning in a production environment for eight months without a hitch," he reports. "And CyberGuard rocks the competition in the performance impact category."

With a track record of NO (that is "zero") vulnerabilities and roots in providing "bullet-proof" infosecurity, it's no wonder CyberGuard's security solutions are found in Fortune 1000 companies and governments worldwide. CyberGuard's award-winning, industrial-strength firewall/VPN and security products protect the integrity of data and applications from hackers and digital thieves. The company has world headquarters in Fort Lauderdale, Florida, and branch offices worldwide.

For more information, visit www.cyberguard.com

THE SECURE ENTERPRISE | COUNTERMEASURES

COMPANY PROFILE

SOLUTIONS FOR A SECURE, HIGHLY AVAILABLE ENTERPRISE

ESTABLISHED IN 1990, STONESOFT IS ONE OF THE WORLD'S leading providers of software for high availability network solutions. Stonesoft's global headquarters are in Helsinki, Finland; Americas headquarters are in Atlanta, Georgia and Asia Pacific headquarters are in Singapore. In 2000, Stonesoft announced its vision for the Secure, Highly Available Enterprise, and the intent to extend its core technology offerings to support the entire enterprise.

Stonesoft is a leading provider of network security and high availability software for ISPs/MSPs/ASPs, telecommunication companies, financial institutions, high-volume Internet sites and large enterprises. Over 90 percent of all Fortune 500 telecommunications companies, two out of every three top commercial banks, securities companies and computer manufacturers depend on Stonesoft to enhance their network confidence with Stonesoft solutions.

THE FIRST HIGHLY AVAILABLE FIREWALL/VPN

Stonesoft's StoneGate is the first firewall and VPN solution offering high security, high performance and high availability. StoneGate features an embedded OS for increased security, multiple ISP and VPN load balancing

to ensure continuous network connectivity, and advanced centralized administration tools for enterprise-wide management of the firewall infrastructure. StoneGate's unique architecture supports various hardware platforms, including numerous appliance options available through Stonesoft's Open Appliance Strategy.

STONESOFT

Stonesoft's proven StoneBeat clustering product line provides high availability and load balancing for third-party firewalls, web, content-scanning servers and server applications. StoneBeat prod-

ucts have thoroughly penetrated six primary vertical markets, including banking and finance, telecommunications, utilities, government, media and the service industry.

Stonesoft has forged several key strategic partnerships and global industry alliances with leading security software developers, MSPs, channel distributors and hardware manufacturers. With a strong commitment to customer service and support, leading products and the best strategic partnerships, Stonesoft offers its customers a complete and scalable network security solution. Stonesoft delivers to its customers the vision of a secure, highly available enterprise.

For more information about Stonesoft, go to www.stonesoft.com.

online transactions, these same transactions account for more than 50 percent of disputed charges.

Authentication problems create other hassles, too. More than 50 percent of help desk calls are password-related. Duplicate and co-mingled patient records hike health care costs by an estimated \$29 billion a year and the majority of medically-preventable errors that cause 100,000 deaths annually are attributed to missing or inaccurate patient histories.

Similar problems affect interactions between companies and their customers as well as even simple communications between individuals or corporate entities. So newer methods have been developed that either replace or add to username-password authentication.

"Today's security environment," maintains Bob McCashin, chairman and

CEO of Identix Inc., "requires a new paradigm — one that associates actions with identity. Because security begins with the individual — who are they and what can they do — it is the crucial first step to protect a corporation's proprietary information, transactions, physical locations, etc."

SMARTCARDS AND TOKENS. Tokens strengthen authentication by frequently changing identification coding: after its user enters a password, the token displays an ID that enables the user to log onto a network.

The electronic memory and embedded microprocessors in smartcards empower them to act as more than ID instruments; they can, for instance, serve as a form of digital cash or store an entire (and updateable) medical record.

Smartcard adoption in the U.S. has

been slowed by incompatibilities in smartcard programming languages. But that may be changing with the arrival of the latest version of Java Card, which brings multi-functionality to a single card, abides by international standards and addresses such Java security issues as applet control.

BIOMETRICS. Using physical characteristics or behavioral traits — such as fingerprints, voiceprints or retinal images — that can be automatically checked and verified, now attracts increasing interest as an alternative or add-on to the easily compromised username/password combo.

Since biometric authentication can be costly and intrusive, organizations need to consider the trade-offs. Iris scans, for instance, are very accurate but also intrusive, so they're best used where high levels of security are necessary. Fin-

If you only want a firewall, there are other options...

	StoneGate	Check Point NG	Cisco PIX 535
Enhanced security with Integrated OS	Built-in	No	Yes
Enhanced security with multi-layer inspection	Built-in	Stateful-only	Stateful-only
Firewall HA Reliability	Built-in	Add-on	Add-on
Internet Reliability with multi-ISP connections	Built-in	No	No
Enterprise Manageability	Built-in	Add-on	Add-on
Scalability	Built-in	Add-on	Add-on
Gigabit Performance	Yes	Yes	Yes
Gigabit Affordability (before the add-ons)	\$\$	\$\$\$\$\$\$	\$\$\$\$\$\$

... but why buy a mere legacy firewall?

With **StoneGate™** you get much more!

Unlike the competition, StoneGate offers much more than network security. You also need high availability, performance, and manageability, so why buy a mere firewall?

For continuous firewall uptime and top performance, StoneGate is built with high availability clustering and true dynamic load balancing. And our unique Multi-Link Technology™ manages multiple ISP connections for Internet access redundancy—a critical factor for successful VPN deployment.

A global software and solutions company, Stonesoft builds confidence.

Learn more—visit www.stonesoft.com, call 866.869.4075, or email info.americas@stonesoft.com.

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gerprint authentication is less accurate, but also less intrusive and not as expensive, so it can be effective in less critical security environments.

Biometric authentication techniques are being combined with personal identification numbers, encryption, tokens, smartcards and other devices and applications. Identix's *BioLogon*™ biometric authentication solution, for instance, supports multiple authentication factors and login methods (including fingerprints, smartcards and passwords), can be centrally managed, uses 128-bit encryption, features server redundancy and load balancing, and speedy enrollment. Identix biometric solutions can also be embedded into application, network and hardware security solutions.

And the company's *itrust*™ Web-

based identity and access management platform generates a transaction audit trail that enables organizations to tie individual identity to particular transactions to reduce fraudulent disputed charges.

"Bringing together biometric technology such as fingerprints with a multifactor authentication identity management platform," explains Identix's McCashin, "allows companies to offer continuity of authentication. This is important because it provides a complete authentication solution that requires re-verification of a person's identity at every step.

"For example," he continues, "an employee's computer system and physical access rights are stored on his/her employee badge using smartcard technology that includes a fingerprint tem-

plate. As the employee navigates freely throughout physical locations, networks, and protected resources he/she continually reaffirms identity using their badge and the touch of a finger. Continuity of authentication offers a complete solution that is convenient and cost-effective."

MANAGING ACCESS. When heterogeneous IT environments must serve many users at different levels of trust, managing authorization and access gets complex.

Several vendors — including RSA Security, IBM/Tivoli and Netegrity — incorporate content personalization, role-based access control and user-self-registration into access management offerings that support a range of security devices and authentication options.

Thus users can be authenticated, allowed into a Web portal and

EXECUTIVE VIEWPOINT

EXTENDING E-SECURITY INTO THE TRUSTED NETWORK



APPGATE IS A PRIVATELY HELD COMPANY THAT DESIGNS and manufactures e-security hardware and software network solutions for small to large enterprises. AppGate's mission is to enable organizations to protect critical information resources by controlling access not just to the firewall at the front gate, but all the way to the application level within the trusted network. This innovative solution completely redefines the concept of virtual private networking.

As businesses increase their reliance on the Internet to connect geographically dispersed business units and external supply chain partners, they need protection from security breaches both from within the trusted network, as well as from the outside. They need a way to determine who can access which applications, from where, and when.

Unfortunately, this fine-grained control at the unique user and application level was lacking in traditional VPN security structures. Traditional security measures were not extensive enough, too restrictive, and raised the overall complexity of the IT environment without much return on investment. AppGate saw these critical gaps in existing VPN security strategies and developed a powerful, flexible solution to address them.

HIGH ROI

This innovative VPN security solution provides high return-on-investment in

multiple ways:

- **REDUCES IMPLEMENTATION COSTS** by operating as a standard application on industry-standard servers, requiring no modification to IT infrastructure, network address translation (NAT) schemes, or applications
- **REDUCES IMPLEMENTATION COSTS** by enabling you to leverage any access control, authentication, and encryption solutions you may already be using
- **REDUCES ADMINISTRATION COST** through centralized administration and an easy-to-use graphical interface
- **REDUCES DEPLOYMENT COST** by eliminating distribution requirements; users can download the AppGate portal as a Java® applet via their Web browser.
- **REDUCES SUPPORT COSTS** with a simple user interface that virtually eliminates training and tech support requirements.
- **PROTECTS THE ORGANIZATION FROM HUGE POTENTIAL LOSSES** caused by hacking, theft of confidential data, fraud, viruses, vandalism, or misappropriation of network resources.



Alfred Moresi, CEO, Appgate

For more information, visit www.appgate.com



Free range works for this group...

but not for yours.

Free-range access to your network is a risk you may not know you are taking.

A barnyard fence just isn't enough. You need to guard the hen house, too. To protect your critical applications and resources, you need a Virtual Private Network that goes beyond a point-to-point connection. **AppGate™ VPN** and **AppGate PowerBox™** go further by extending e-security into the internal, trusted network, all the way from the users to the applications. AppGate provides full access control, allowing an enterprise to customize access so you know who has access and when they have access to your critical applications and services. Protective boundaries are important...even for chickens.

For more information, visit our website at www.appgate.com or give us a call at 1-866-AppGate.

***app*GATE™**
We take e-security further

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authorized to access back-end applications with a single sign-on. Several vendors are developing XML-based solutions for exchanging authentication and authorization data between vendor environments, including between application server security systems, so soon users will be able to click from host website to a partner's website without re-authorization.

PREVENTION & RESISTANCE

The Internet has become such an integral part of most companies' business environments that when website or network operations are interrupted, the costs can be enormous. The cost of downtime varies depending on the business — from \$100,000 to \$1 million an hour. Or more. For instance, the now infamous 22-hour outage that afflicted eBay in June, 2000 caused that company's market cap to plunge a terrifying \$5.7 billion.

One of the best ways to prepare for trouble involves anticipating it and pre-

venting it. For CIOs this typically means three things:

DESIGNING RESILIENT SYSTEMS AND NETWORKS TAKES MORE THAN SECURITY. IT ALSO TAKES:

- High Availability
- Fault tolerance and resource failure
- Predictable performance
- Transparent network system management

1. Systems and network's must be designed to be truly resilient so they can accomplish their mission even when failure, accident or even intrusion does happen. This involves not only high levels of security but also:

High availability: 99 percent availability translates into a yearly downtime of

87.6 hours; for most businesses, availability needs to be 99.999 percent or better, delivering less than 5.26 minutes downtime a year.

Fault tolerance and resource failover: when outages or failures do occur, a system or network behaves in predictable ways and a backup system kicks in transparently.

Predictable performance: systems and networks can consistently handle peaks and troughs in traffic and demand.

Transparent network and system management: updates, upgrades and other straightforward changes must be easy to implement, regardless of the sys-

tem's complexity.

2. Systems and networks must be hardened to thwart malicious attacks and intrusions. "Non-hardened applications and operating systems are open to attack and the most costly attacks occur from the inside," observes Giga's Rasmussen. "If an organization is relying on its external perimeter defenses to protect them, it ignores the insider attack. This is part of the M&M story of security — hard and crunchy on the outside while soft and chewy on the inside."

3. Key applications and data must be backed up so they can be recovered after a failure, accident or attack without loss of business services.

VIRTUAL PRIVATE NETWORKS (VPNS). The appeal of creating a secure 'tunnel' through the Internet has been dampened by performance degradation due to its resource-intensive encryption technology and struggles to make VPNs fault-tolerant. But current higher-speed crypto ASIC design has helped make VPNs an effective alternative to dedicated leased lines.

These days, VPNs can handle as many as 50,000 tunnels, offer triple-DES (Data Encryption Standard) security, can be integrated with firewalls and intrusion detection systems, and support digital certificates. A growing number of VPN vendors — including Check Point, Nokia, AppGate, RadGuard and NetScreen — offer VPN appliances, some of which include high availability features.

"In today's uncertain market where information security is a must yet budgets are being scrutinized," says Alfred Moresi, AppGate's CEO, "CIOs should be looking to appliance-based VPN solutions that offer the same comprehensive capabilities of software products, yet in an easy-to-install, low-maintenance and affordable plug-n-play hardware appliance."

AppGate, for one, emphasizes the

WHAT CAUSES DOWNTIME?

IT industry researcher International Data Corp. has identified the four areas causing downtime:

- **NETWORKS** — most often caused by ISP connection downtime and network LAN overload,
- **SERVERS AND OPERATING SYSTEMS** — common problems caused by either CPU overload or by network interface card failure,
- **APPLICATIONS** — trouble usually comes from slowed database performance and process hang-ups.
- **NETWORK MAINTENANCE ALSO CONTRIBUTES TO DOWNTIME WOES, SINCE MAINTENANCE CAN NO LONGER BE CONDUCTED DURING 'OFF HOURS,' — there no longer are 'off hours' in a 24x7 international economy.**

CASE STUDY

SONY FIGHTS INTRUSION WITH "CRYSTAL BALL"

A DIVISION OF SONY, INC., SONY PICTURES ENTERTAINMENT (SPE) develops and distributes a wide variety of programming including movies, television, videos and DVDs. Not surprisingly, a critical task of SPE's Information Protection and Security Group is the protection of large amounts of intellectual property. A compromise of security can cost the company valuable intellectual property as well as thousands of dollars and months of time.

Jeff Usan, Director of Information Protection and Security at SPE, is charged with the difficult task of managing security over a large, open network where users have access at varying times (depending upon the project) and can go on and off the network quickly. Knowing who should have access and when — including executives, producers, distributors, contractors, product companies, subcontractors and talent alike — is of utmost importance to the security and protection group.

NEEDED: ADVANCED THREAT MANAGEMENT SOLUTION

Usan's team tested numerous traditional signature based IDS (Intrusion Detection System) products, but found they produced an unmanageable amount of false positives and did not have the comprehensive enterprise understanding needed for the SPE network. Clearly, a signature-based Network IDS was not the answer for SPE.

What Sony Pictures Entertainment needed, recalls Usan, was an advanced threat management solution that would take nominal resources to maintain and require limited resources to track and respond to suspicious network activity. What's more, the solution had to scale and work well in a larger network of partners as well as be able to leverage information across Sony entities. And that's precisely what Recourse Technologies delivered via its advanced network intrusion detection solution, including ManHunt™.

SPE'S RECURSE AGAINST HACKING

Today, SPE depends on ManHunt protocol anomaly detection to detect previously unknown and new attacks as they occur, close the window of vulnerability inherent in signature-based systems and substantially decreasing false positives; track attack information



across network administrative domains; quickly find point(s) of entry of an attack, especially for distributed denial of service attacks with spoofed source addresses; and provide threat awareness without data overload.

Moreover, real time event aggregation and correlation enables SPE to gather intelligence across the network to quickly spot trends, sort

related events and recognize incidents as they happen — dramatically reducing the effort required to identify threats and dramatically reducing the time to respond to such events.

And given the complexity of the SPE network, Usan appreciates the single point of control and monitoring as well as the scalability in a multisite enterprise.

"Recourse's advanced intrusion detection system is the closest you can come to a crystal ball; it tells you what's happening and what just happened," reports Usan.

Recourse Technologies is the leading provider of threat management solutions that detect, analyze, and respond to both known and novel threats, including intrusions, internal attacks and denial of service attacks. With Recourse's advanced intrusion detection solutions ManHunt and ManTrap®, businesses gain the time and information critical for enabling secure and uninterrupted business operations.

To learn more about managing network threats, visit the Web site at www.recourse.com. Or call 1-877-786-9633.

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importance of keeping application servers separated from the untrusted public Internet. When key servers are protected from unauthorized traffic, operating systems, network protocols and applications stay beyond the reach of an attack.

"Beyond just protecting the network from external threats, CIOs should be thinking about how to protect the internal, trusted network as well," says Moresi. "Many of today's VPNs only provide a site-to-site, or device-to-device connection, leaving users wide open to

access according to source/destination network address and each packet's port number as determined by administrator-defined rules. This approach is inexpensive, fast, transparent and flexible — but tough to configure and offering limited logging facilities.

Dynamic packet filtering/stateful inspection makes deny/allow decisions based on all the data in the packet thanks to continual monitoring of the *state* of the connection — so, in effect, the firewall remembers the state of each

ADVANCES IN TECHNOLOGY MAKE IT EASIER TO HAVE BOTH SECURITY AND PERFORMANCE. CIOs SHOULDN'T SETTLE FOR ANYTHING LESS.

access any internal resources or information they want. By providing a secure connection from the user all the way to the application or resource itself, businesses can ensure the highest level of protection for their IT assets."

The AppGate Server protects application servers from unauthorized access, encrypts network traffic, authenticates users, makes authorization decisions and logs all user actions. To access a protected application server, a user launches the AppGate Client, which sets up an encrypted tunnel between the workstation and the AppGate server, authenticates the user and enables authorized interaction.

FIREWALLS. Traditional software-based firewall vendors like Check Point, Computer Associates and Symantec/Axent face mounting competition from firewall appliance vendors, including Cisco Systems, Nokia and CyberGuard.

Three kinds of firewall architectures currently dominate:

Static packet filtering, which works at the network layer of the OSI stack, makes simple deny/allow choices

according to source/destination network address and each packet's port number as determined by administrator-defined rules. This approach is inexpensive, fast, transparent and flexible — but tough to configure and offering limited logging facilities.

Proxy servers, which work at all seven OSI layers, function as stand-ins, relaying valid requests between trusted and untrusted networks and never permitting direct connection between them. Because proxy servers make large processor and memory demands, performance is affected.

COMBINING FIREWALLS AND VPNS. "When it comes to choosing security technologies," notes Pat Clawson, president of CyberGuard Corp., "many people choose the easy route instead of the most secure. Packet filtering instead of proxies for firewalls. Speed over security. It's not surprising that there are security breaches as a result."

"Advances in firewall and VPN technology, high performance hardware and intuitive manageability features, however, make it easier to have both security and performance," Clawson says. "CIOs shouldn't settle for anything less."

CyberGuard's plug-and-play firewall/VPN appliances combine all of these approaches to incorporate multi-level security that treats each layer of the secure operating system discretely, maintaining complete separation of network traffic from system components. In December 2000, CyberGuard's appliances became the first to earn the Common Criteria Evaluation Assurance Level 4 certification, a rigorous security standard recognized by 15 nations.

"Without question," Clawson asserts, "the combined appliance is easier to install, implement and use. Updates and enhancements will apply to both functionalities."

Limiting access to a corporate network from the untrusted public Internet can become quite complex in a larger enterprise with many distributed firewalls. Enterprise firewalls tackling this challenge must be extremely scalable in order to handle the centralized management capabilities built into distributed firewalls as well as the heavy throughput that online transaction environments require.

Among the products that can do this is Stonesoft Corp.'s StoneGate, which provides clustering and management capabilities that monitor distributed firewalls and reaches all the way to a network's ISP connection.

"Astute buyers and their distributors," notes Esa Korvenmaa, Stonesoft president and CEO, "will be looking for a combination they haven't seen until now: high value and high performance."

Because StoneGate's clustering software dynamically handles load balancing, throughput is maximized, failover is automatic and maintenance can be done on the fly. StoneGate also obviates need for multiple high-availability load-balancing solutions for servers and edge routers, and its high-availability capabilities improves VPN reliability.

"The latest challenge in network management is to provide system

CASE STUDY

FILTERING AND THE BOTTOM-LINE

NOT ONLY IS NETWORK SECURITY MORE COMPLEX THAN ever before, but also the very definition of network security has expanded. Where once network security was just about guarding against hackers and viruses, today it's also about managing IT resources more efficiently.

More and more executives are realizing that installing firewalls and anti-virus software without Web and email content filters is like locking the doors but leaving the windows open. SurfControl, the number one Internet filtering company in the global security market, offers the one-two punch that companies need for more complete security.

Today organizations such as the Internal Revenue Service, Crate & Barrel, Ricoh and Toyota Motor Sales USA rely on SurfControl to protect their networks, minimize legal risk and increase employee productivity.

SURFCONTROL: THE FILTERING COMPANY

SurfControl provides customers with a full solution that includes Web and email filtering, relevant content and advanced artificial intelligence tools.

SuperScout Web Filter focuses employees on using the Internet for conducting company business, rather than on irrelevant surfing. SuperScout Web Filter's threshold blocking allows administrators to set user access limits according to length of time or the total bandwidth used in a given day. Coupled with a new enhanced reporting facility — including new bandwidth analyses that illustrate how and when bandwidth is being consumed — SuperScout Web Filter offers companies greater precision in setting rules for Internet access and implements them down to the individual user and individual Web page.

SuperScout Email Filter gives designated managers appropriate control over how company employees use corporate email. By com-

bining features which allow administrators to recognize explicit adult image files with a Web administrator capability that enables authorized personnel to securely manage the product remotely, SuperScout Email Filter helps companies secure networks against email viruses, optimize employee productivity and network performance and protect critical information.

SurfControl has the largest collection of the world's most trafficked Web sites in the industry with more than 4 million site entries

thoughtfully organized into 40 categories and 130 subtopics. More than 65 languages, from sites registered in more than 200 countries, are represented in the Content Database, giving SurfControl the most international content in the industry. Complete categorization technologies and proven processes using automated tools, spidering tech-

nologies and an expert human review team for sourcing and categorizing help to maintain the Content Database. Daily updates — plus constant culling and aging — makes this the most relevant and accurate filtering list in the market.

SurfControl also offers customers a set of tools that use adaptive reasoning technology to interpret information context. The Virtual Control Agent provides dynamic and automatic Web site categorization while the Virtual Image Agent offers intelligent analysis and recognition of adult images within email attachments.

THE BOTTOM LINE

At the end of the day, it's all about securing corporate resources. With SurfControl's full solution, corporations can maximize their resources and boost their bottom line. It's as simple as that.

Headquartered in Scotts Valley, California, SurfControl works with a variety of industry partners including AT&T, Check Point Software, Cisco Systems, Hewlett Packard, IBM, Intel, and Microsoft Corp.'s Web TV.

For more information, visit www.surfcontrol.com



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administrators with the ability to apply and enforce high availability principles," says Stonesoft's Korvenmaa. "In addition to high performance and high security, a firewall VPN strategy should also incorporate high availability principles across multiple ISP connections for multiple VPN tunnels."

CONTENT FILTERING. "Security is not just about firewalls and hackers anymore," says Kevin Blakeman, president of SurfControl. "It's also about optimizing resources and mitigating legal risks. In addition, organizations need to balance potential threats with the critical role the Internet and e-mail play in today's connected economy."

One example is the Health Insurance Portability and Accounting Act (HIPAA). Compliance with this new law protecting medical patients' privacy becomes mandatory in April, 2003 and is already creating a new standard for ensuring the security and confidentiality of individually identifiable information transmitted electronically. The upshot is that organizations must not only limit what's disclosed but also who it's disclosed to; those who fail face criminal penalties.

Because e-mail is one of the chief means of transmitting this sensitive information, using software that filters e-mail content can prevent transmission, either malicious or accidental, of information that should stay private.

SurfControl's SuperScout Email Filter, for instance, prevents the wrong data from getting e-mailed; even encrypted messages sent by unauthorized personnel within your company can be blocked, isolated, allowed or stripped. SuperScout also stops viruses, thanks to its anti-virus scanning capabilities.

Just as dangerous can be the Web-surfing habits of employees, who may not only be eating up bandwidth with personal activities like finding their favorite tunes or planning a vacation but may also be inadvertently downloading malicious code. Web content filtering programs, like SurfControl's SuperScout Web Filter, track who's doing what on the Web and enable administrators to establish Internet access rules for different user groups.

"Installing firewalls and anti-virus software without Web and e-mail filtering," says Blakeman, "is like locking the doors but leaving the windows open."

BACKING UP THAT DATA. According to Strategic Resource Corp., 60 percent of corporate data resides on PCs and notebook computers and up to 96 percent of business PCs do not have data backup. That's a lot of unprotected data.

Since it's unlikely that every PC-wielding employee can be counted on to conscientiously back up the data on their machines, IT departments need to incorporate PC lifecycle management into their business continuity and disaster recovery plans.

"Yet," points out Bob Brennan, CEO at Connected Corp., "most companies do not have an automated information protection and recovery pro-

gram for their employees' desktop and laptop PCs. Successful companies have paid attention to this revelation and are intensifying efforts to fully protect the valuable corporate information that resides on these important devices."

One approach is offered by Connected Corp.'s Connected TLM, which automatically compresses and encrypts PC data before backing it up via a corporate network. Connected TLM also includes modules that: give administrators control over remotely located PCs; migrate PC 'personalities' to new machines; repair operating systems states, registries and applications; and keep PC software up-to-date (via asset discovery and management capabilities from Peregrine Systems).

"We should always have a line of defense in place prepared to deal with the problems created when security fails," says Brennan. "A strong combination of awareness, security and — perhaps most important — recovery capabilities will always be the best defense against any attack. One without the others will always fail."

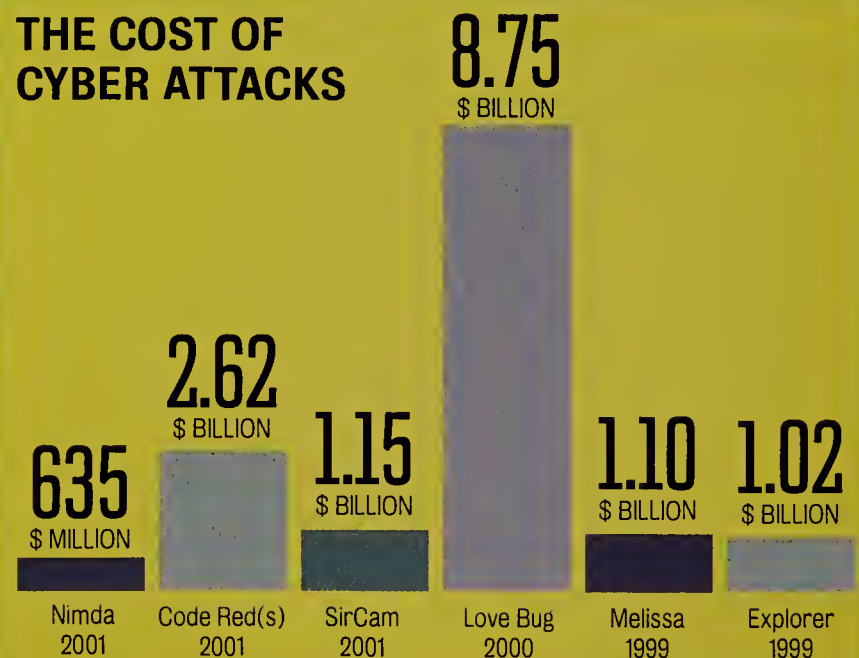
DETECTION & RESPONSE

"Since many attacks are the result of new weakness uncovered by hackers or

others, the key is constant vigilance and monitoring," says Frederick Rica, partner and threat and vulnerability assessment practice leader at PricewaterhouseCoopers. "It's important that CIOs stay on top of new threats and vulnerabilities as they are made known and then implement a process to patch those holes and perform ongoing testing to make sure they don't re-emerge."

FIGHTING THE VIRUS WARS. When the first virus infect-

THE COST OF CYBER ATTACKS



SOURCE: Computer Economics [www.compecon.com]

COMPANY PROFILE

SAFEGUARDING BUSINESSES FOR OVER 40 YEARS



THE WORLD HAS CHANGED; IT'S JUST NOT AS SAFE AS IT once was. The things you once took for granted—like the day-to-day security of your business—deserve a closer look. Most importantly, you have an obligation to your people, shareholders and customers to protect your assets. How do you do this, and where do you start?

TRW CRITICAL INFORMATION AND ASSET PROTECTION (CIAP)

A complete security program for today's world must address the critical phases of the Business Protection Lifecycle. **ASSESS** your current environment, business strategy, policies, and threats to identify vulnerabilities. **SECURE** those vulnerabilities using proven solutions designed to optimize your security investment. **RESPOND** to events as they occur to maintain operational integrity. CIAP solutions from TRW are designed to fulfill every requirement of the Business Protection Lifecycle. Our CIAP solutions are modular to add value to your business *when* and *where* you need it.

■ **CIAP Assessments:** A comprehensive, business-oriented assessment of security threats, vulnerabilities, risks and business impact for a company's complete asset base.

■ **CIAP Security Infrastructure:** A technology-oriented suite of security

solutions for both physical and cyber security, integrated by a common security management platform.

■ **CIAP Business Continuity:** A complete set of business continuity solutions that enable continuous availability of a company's asset base.



A STEADY PARTNER IN A CHANGING WORLD

For over 40 years, TRW has successfully supported the security requirements of some of the world's most security-conscious organizations. Because our industry-leading R&D investments keep us on the cutting edge of business protection technologies, TRW can deploy the right solution at *each* and *every* phase of the Business Protection Lifecycle.

Equally important and thoroughly proven, TRW's implementation methodology and over four decades of security engineering leadership have minimized risks and lowered the cost of business protection at countless locations worldwide. TRW also provides CIAP solutions as part of its strategic IT outsourcing services, Information PartneringSM.

For more information on TRW CIAP or Information PartneringSM, visit us at www.trw.com/CIAP or www.trw.com/IP.

ed what was then the ARPANET back in 1987, a new era was born. Now enterprises struggle to remain uninfected. Best bet: antivirus programs from Symantec, McAfee and others that continually monitor systems and remove any discovered culprits. But don't forget to regularly update that virus signature database.

INTRUSION DETECTION. A more sophisticated approach, of course, searches out patterns in data and network traffic that indicate attacks and responds before harm can be done.

Network-based intrusion detection systems (IDSs) scrutinize network packets for malicious ones designed to sneak past firewall filtering. Host-based IDSs guard individual computer systems, examining system calls, file

access, application execution, etc., and hybrid IDSs combine these functions to deliver consolidated alert data to a central console.

Pattern-detecting IDSs can be useful against viruses, too. Currently, most information systems cannot *detect* viruses and worms — instead they *react* to viruses and worms for which antidotes have already been created. The Code Red worm, for instance, struck over 150,000 Web servers in a single day before anyone knew what it was or how to defend against it.

But not every server sniffed out by Code Red was successfully infected during the worm's initial strike. A number of businesses that had implemented Recourse Technologies' ManTrap and ManHunt products were able to

avert the attack before the worm was identified.

Believing it to be a server, Code Red hit ManTrap's honeypot, set up to bait intruders, and was immediately detected. ManHunt recognized the code as an HTTP protocol anomaly and alerted users, who could then deflect it before Code Red was known even to experts.

"Advanced intrusion detection and threat management solutions," says Recourse Technologies' Huerta, "provide early warning signs and background information on internal and external hacker activity. The detailed information generated by threat management solutions provides CIOs with the critical time needed to deploy effective countermeasures before the full attack wave hits." **SD**

STAYING ALIVE: BUSINESS CONTINUITY PLANNING

IT'S IMPORTANT THAT CIOs BEGIN to take a more holistic, lifecycle approach to security. Today's threats are more numerous and complex than those we have faced in the past. This trend is not going to improve — tomorrow's threat environment will be much worse than today's."

So says Michele Kang, vice president and deputy general manager of TRW Global Information Technology. "It is simply not sufficient," she continues, "to rely on just one or two point solutions for enterprise security. A lifecycle approach is required where the enterprise continually cycles through the three critical phases: assess, secure and respond."

TODAY'S THREATS ARE MORE NUMEROUS AND COMPLEX THAN IN THE PAST... TOMORROW'S THREAT ENVIRONMENT WILL BE MUCH WORSE THAN TODAY'S.

After all, even the best efforts to harden Internet-linked networks and systems can't remove *all* vulnerabilities to intrusion, attack, accidents and failures.

"Organizations," says Ken Boyd, vice president of business development at Peregrine Systems, "are introducing

point solutions for each type of possible threat when the reality is that you should be putting management controls in place that will enable your organization to respond to any type of situation — including those that you have not identified as a threat."

That's why security experts talk about *survivability*: making sure that information systems remain robust when they are under attack or suffering failure so that they can continue to fulfill their missions. What's key is not the survival of any given system but rather the *continuity of business-critical services*.

Thus survivability means something different for every company, and even every moment. A company that suffered system losses in the September 11 attacks

but preserved the integrity of its data and restored basic operations a few days later can conclude that its overall systems mission was fulfilled, although some systems were completely destroyed.

But if those same systems had crashed without warning a month earlier

and remained out of service for several days under normal conditions — costing the company its ability to conduct business — then those systems would have failed in fulfilling their mission, since essential services would not have been preserved.

ANTICIPATION

The planning needed to maintain this kind of business continuity involves:

DISASTER RECOVERY — running critical technologies and applications from alternate sites

WORKSPACE RECOVERY — running critical business processes from alternate sites

BUSINESS RESUMPTION — workarounds enabling continuation of critical business functions until disrupted capabilities are restored

CONTINGENCY PLANNING — managing external events that impact the business

CRISIS MANAGEMENT — initial response to disruptive events

Julia Allen of Carnegie Mellon's CERT Coordination Center notes that organizations can balance operational and security needs "by applying risk management thinking to securing information assets in the same fashion that risk management is employed to manage risks to other critical business drivers, such as preserving/growing market position and reputation, and building

COMPANY PROFILE

FOCUS: IDENTITY AND ACTIONS OF THE INDIVIDUAL

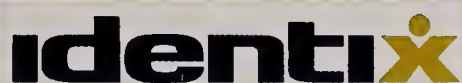
**BARRIERS ARE GOOD. BUT THEY'RE NOT GOOD ENOUGH.**

The heightened safety needs of today's world demand a new security paradigm, one that focuses on the identity and actions of the individual itself.

While biometrics allow us to biologically verify that each person is who he or she claims to be, Identix takes the new paradigm one step further by regularly associating the individual with his or her actions. This is what we refer to as *Continuity of Authentication™*.

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customer trust."

Many CIOs seek the help of experts when developing a business continuity plan, which involves:

PLANNING AND CONSULTING, including business continuity planning and management software, hot-site facilities, rapid hardware replacement, high-availability networking, PC-based planning tools

RECOVERY SITES, including hot sites, cold sites, mobile sites

DATA STORAGE, including off-site storage and electronic vaulting.

Peregrine Systems, for instance, offers both infrastructure management services (managing and securing multiple types of key assets) and crisis management, which provides the underlying technology for a command-and-control

system, so enterprises can prepare for and instantly respond to crisis situations. Built on Peregrine's Action Request System development platform and Peregrine's Business Integration Suite, this new offering allows organizations to manage an event from initial discovery through closure.

And TRW's Global Information Technology Division provides a range of business continuity services, including risk management and vulnerability assessment, system architecture and design services, secure network solutions and secure remote outsourcing facilities.

From TRW's perspective, though, business continuity planning isn't the whole story.

"Business continuity is one step in the business protection lifecycle," notes

Kang. "It is important to not simply focus on business continuity without addressing the other steps. You need to *assess* your current environment, business strategy, security policies and procedures and threats to identify vulnerabilities. Then you must *secure* those vulnerabilities using proven solutions designed to optimize your security investment. Finally, an organization must *respond* to events as they occur in a manner that maintains the integrity of their operations."

HELP FROM BELOW

"Employees lacking adequate security education pose the greatest threat to the enterprise," Kang reminds us. "As insiders, they can unknowingly compromise the technical security controls

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CASE STUDY

LAW FIRM'S DATA ALWAYS AVAILABLE, ALWAYS PROTECTED



WOMBLE CARLYLE, ONE OF THE SOUTHEAST AND MID-Atlantic regions largest business law firms, required a cost-effective, secure and reliable solution to help its mobile workers rapidly backup and restore PC data while traveling. In other words, it needed a way to *keep its data safe, PC users up and running, and support costs down.*

"We work in an environment where time is money and if an attorney does not have access to his or her case data, it could be detrimental to the outcome of a case," explains Sean Scott, CIO of Womble Carlyle.

Scott needed to find a solution that could ensure that crucial research and data was protected as well as accessible at all times, even on the road. After evaluating a number of solutions, Scott and his IT team concluded that while many tools were adequate for a simple backup/data restore, only Connected TLM from Connected Corporation would enable Womble Carlyle to securely backup and restore a complete system, including operating system, applications, data and registry.

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Currently installed on more than 400 laptops and 100 desktop systems in nine of the law firm's offices, Connected TLM protects Womble Carlyle's critical data using any Internet connection. The result? Attorney's at any location

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According to Scott, Connected TLM backs up and restores all data files

securely in minutes, saving precious time and money. And its advanced encryption protects and secures all data as it's sent over the wire and stored. What's more, the Connected TLM Data Center's built-in redundancy and replication technology provides high availability for mission-critical information.

"Connected TLM significantly reduces the time it takes my IT staff to troubleshoot and restore an ailing computer," reports Scott. "Connected TLM presents us with an efficient way to resolve problems and ensure that vital data is protected at all



CIO Sean Scott prevents downtime losses

times. This capability can save the firm many thousands of dollars in lost downtime."

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used to protect the enterprise. Security is everybody's responsibility, not just the information technology organization or the security staff."

Richard Hunter, vice president of security research at Gartner, agrees and offers an example:

"The break-ins on Microsoft's servers that occurred in October 2000 apparently began with the infection of a single employee's PC with a Trojan Horse virus. Once that employee logged into Microsoft's network — an action which he was authorized to perform — the virus was inside the firewall and bad things happened quickly after that. 'Bad things,' in this case, included essentially unfettered access to servers containing source code for Microsoft's operating system products.

"You can't make a highway safe if the drivers don't know how to drive,"

says Hunter. "In a distributed computing environment, entry points for threats are also distributed, and individuals must be aware of the nature of threats and the ways and means of self-protection."

For organizations with large numbers of users, complex interactions and diverse and disparate networks, platforms and systems, a security policy is essential in order to effectively cope with day-to-day operations as well as exceptional, compromising events.

"To improve an enterprise's protection," Kang believes, "technology must be supported by policies, procedures and organizational and technical frameworks. Policies and procedures are needed to define what is acceptable and what is not, and to designate who within the organization is responsible for verifying and assuring compliance."

At minimum, every corporate security policy should address:

- Business continuity planning
- Security organization
- System development and maintenance
- Computer and network management
- Assets classification and control
- System access control
- Physical and environmental security
- Personnel security

Once security policy is developed, it must be implemented, documented and rigorously and regularly tested. Often this will entail a significant employee-awareness campaign and a committed training effort.

"Awareness," says Peregrine's Boyd, "is key to enabling your entire organization to know what to do in the event of a security breach. Equally important is your organization's capability to assess and your ability to respond." **SD**

How safe is your data? (Really.)

“An enterprise cannot become resilient unless it can effectively operate a **backup-and-restore** method for all of its user workstations - **in the offices, mobile and remote.**

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*Best Practices for Mobile Workforce Information Backup,
John Girard, Gartner Research, QA, Dec 2001*



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are the two biggest causes of low morale,” says Rick Chapman, CIO and chief administrative officer at Kindred Healthcare in Louisville, Ky. “It doesn’t matter what the economy is like.”

The first step toward fixing bad morale is acknowledging that the problem exists. The second step is realizing that it’s your responsibility to make it better. While morale may seem like the domain of HR, that’s a cop-out, says David Van De Voort, a principal consultant and leader of the IT workforce effectiveness group at Mercer.

“The CIO is the head of a community, a family of professionals,” he says. “No competent CIO would leave morale for HR to deal with. The CIO has to be the one who sets the tone and defines the IT culture in any organization.”

While CIOs should not relegate responsibility for morale to HR, you can and should lean on HR for help. Having an HR representative participate in meetings can help make employees feel cared for by the company. The HR rep is also another person an employee can talk to. No matter how open your culture, employees aren’t always comfortable talking to the CIO, and that means they may not tell the whole truth about how they feel if they do talk to you.

There are, however, actions you can and must take to deal with and reverse a bad morale situation, including placing special emphasis on management basics such as communication, leadership and special programs for employees: training, rewards and recognition. Here are steps tailored for an IT staff that you can take toward recognizing and rehabilitating low morale.

Look, Listen, Take Nothing for Granted

Morale is like the weather on the plains—it can change drastically in the space of a minute. But on the plains, you can see a storm coming; the warning signs of bad morale are more subtle and difficult to detect. Some old signals, such as increased turnover and frequent absences, aren’t as

reliable now as they once were. People are less likely to leave their position in the middle of a recession, when jobs are hard to find, and since Sept. 11 some companies have discovered that turnover has decreased as employees yearn for stability and security in their life.

Still, being able to identify a morale prob-

I need a lot from them, and I need them to want to give that kind of effort.”

Having daily contact with staff is essential for maintaining morale, says Theresa Welbourne, associate professor of organization behavior and human resource management at the University of Michigan business school in Ann Arbor, Mich. “No organiza-

“ LACK OF COMMUNICATION AND BAD MANAGEMENT, OR LACK OF CONFIDENCE IN MANAGEMENT, ARE THE TWO BIGGEST CAUSES OF LOW MORALE. IT DOESN’T MATTER WHAT THE ECONOMY IS LIKE.

—Rick Chapman, CIO and chief administrative officer, Kindred Healthcare

lem begins by being able to recognize situations that can bring people down, says Ben Holder.

As vice president and CIO of Unifi, a Greensboro, N.C.-based textiles manufacturer, Holder makes it a point to meet with his staff on a daily basis to discuss all aspects of IT and its place in the company. He keeps his ears open for the red flags that could signal trouble.

“The biggest mistake you can make is to ignore the existence of a problem or rationalize it away,” he says. “People shouldn’t be constantly uncommunicative. If they get negative in conversations, you have to perk up your ears. Look at their faces. Are they laughing or smiling at all around the office? Are they quiet in meetings? If behavior and attitudes have changed, red lights should start flashing in your mind.”

Even if you have a large staff—Holder has 60 people in his department—“you have to make an effort to get to know them, know their spouses, know what’s going on in their lives,” he says. “I’ve told them all about my family because I care about them, and they should know that. I want them to care about me as well because

tion is good at being proactive when it comes to morale,” Welbourne says. “Most companies are reactive. CIOs will notice when productivity is down, but if you are just starting to notice, that means productivity has been on the way down for six months already.”

A CIO’s first line of defense when it comes to low morale is to listen closely, she explains. The clues lie in what employees are *not* saying.

“Look at the level of energy,” she says. “Is your staff engaged and participating in projects and meetings, or are they withdrawn and lethargic? If people are no longer contributing, particularly if they used to speak up often, that’s a sign. If people are talking but are being pessimistic, that’s very telling. When things are good, IT workers feel like they can do anything. But when morale is down, they tend to feel like even one project is too much to get done. The sense of urgency on projects diminishes.”

Walk the corridors often, and stand at the door before a meeting starts and listen to what people say as they come in, she says. You may think your employees feel comfortable discussing personal or professional

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issues that are affecting their state of mind, but you're probably wrong.

"You might have an open culture, but people learn from previous jobs to keep their mouths shut," she says. "Employees try to hide their feelings because they are afraid of a punitive backlash if they say anything."

The best way to counteract that kind of wariness is to talk to your staff in a consistent, honest manner.

Honesty Is (Surprise!) the Best Policy

The most important tool for recognizing and combating bad morale is communication. Even if your company is going down the tubes and the future looks grim, tell your staff what's really going on, says Joseph Osbourne, CIO and executive vice president of Tech Data, an IT products and logistics management company based in Clearwater, Fla.

"The biggest mistake is to withdraw and keep information to yourself," Osbourne says. "There's nothing more miserable than when a CIO holes up in his office and assesses a situation behind closed doors and doesn't share information with the staff. It's insulting to your staff's intelligence, and it's very destructive in terms of morale."

Being up front is important, as is honesty. "You don't want to say everything is rosy and then come back in a week and say the company is not going to make it," Osbourne says.

CIOs sometimes keep information to themselves because they don't want to worry their employees, but even though they mean well, hiding information will only spark anger and distrust, says Mercer's Van De Voort.

"Tell them what's going on, and don't hold back because you think it will worry or upset them," he says. "If you stay silent, you won't be protecting them. In fact, you'll be leaving them vulnerable, and that will only make the situation worse."

Before CIO Bill Morrison came to Canton, Mass.-based high-end audio retailer Tweeter Home Entertainment last year, he

Five Keys to Keeping Morale High

1. KEEP YOUR EAR TO THE GROUND. The first step toward dealing with a morale problem is recognizing that you have one. Watch and listen. When people stop talking, you should start.

2. TALK IT OUT. The more information that flows to and from your people, the higher their morale will be. Meet with them regularly. And be honest. You're not fooling anyone.

3. KNOW WHAT YOUR PEOPLE VALUE. IT workers tend to value skill development above everything. Try not to cut the training budget. Establish a lending library. Explore online courses.

4. LAUGH AND YOUR STAFF LAUGHS WITH YOU. People look to their leaders for their emotional cues. If you're feeling hopeless, keep it to yourself.

5. GET EVERYONE INVOLVED. Don't be afraid to ask your staff for suggestions on how to improve morale. If people feel they're being proactive, their morale will automatically improve.

was CIO at Bradlee's, a now-defunct, low-cost retail chain. As Bradlee's spiraled into bankruptcy, Morrison found that constant, honest communication was vital to keep his staff's spirits high.

"When the company is in rough shape, the CIO role is more about leadership than technology," Morrison says. "You have to talk to your staff every day and tell them everything you know, even if the information is changing on a daily basis. Tell them that you'll update them as it comes, but that it could change at any minute. Even if you don't have an answer for them, tell them that you don't know. That helps them know you're being honest, even though it's not an easy situation. Be up front about layoffs and

other reductions in staff. Everyone knows about layoffs because it's in the paper every day. You have to address it honestly with your staff because they're concerned. Try to look ahead so there are no surprises for them."

As a leader, even if your own morale is down, you have to keep your head up. When morale is bad, it's more vital than ever that the CIO be a fount of energy and guidance, even if it's just by keeping a smile on your face, he says.

"This is where your leadership skills come into play," says Morrison. "Everything that you do or say or feel is projected to your staff, and even the slightest negativity will come across. And your staff needs that leadership. When you're the CIO, they think you know everything."

Building morale through improved communication means more than smiling and keeping an open door, however. It means developing trust between you and your employees, and that kind of connection is made by opening up about yourself, both personally and professionally, says Peggy Klaus, a communications consultant based in San Francisco and adjunct professor at the Wharton School of Business's executive MBA program.

"Tell your employees about your leadership style, your philosophy on work and life, the environment you want to create with them, your vision and how you plan to achieve it," Klaus says. "Tell them how you want them to communicate with you, and tell them what your foibles are. Let them see you as you are. Let them know you've been through rough times before and how you plan to get through it this time. Thank them for staying with you through this. Solicit their concerns and offer your help in getting through obstacles. Get specific about how you intend to make the situation better if you can, and how you'll support them."

One of the most powerful actions a CIO can take is to involve the staff in addressing a morale problem, Klaus suggests. Hold a series of meetings with the goal of gathering suggestions for fixing morale. At each

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meeting, update your employees on what's being done and gather feedback on the process as it moves forward.

"By involving your staff, you give them some power over the situation, instead of them feeling powerless," she says. "It will make them feel like part of the solution, instead of part of the problem. By soliciting their advice, you demonstrate a level of respect and trust that they need to see."

Don't Take Away Their Training

One of the most effective ways of boosting IT morale and solidifying a sense of commitment between you and your staff is to shore up your professional development and training program. Training is especially important during down times when you're asking your staff to do more and, in some cases, take over unfamiliar jobs.

"If you shut down your training program, you'll find that a morale problem develops very quickly," says Tweeter's Morrison. "Training drives IT people."

Even if your budget is tight, Morrison says, you can find economical ways to fund training. Options include online learning courses and self-teaching packages. Reimburse your staff for IT textbooks or create a library of books they can use.

"By maintaining the training program, you let your staff know that you're committed to helping them stay current," says Mercer's Van De Voort. "Training indicates an ongoing dedication to employees, and taking it away is one of the worst things you can do."

No Cheap Tricks

Monte Ford, CIO of American Airlines in Fort Worth, Texas, has tackled more seri-

“IF YOU SHUT DOWN YOUR TRAINING PROGRAM, YOU’LL FIND THAT A MORALE PROBLEM DEVELOPS VERY QUICKLY. TRAINING DRIVES I.T. PEOPLE.”

—Bill Morrison, CIO, Tweeter Home Entertainment

ous threats to the morale of his organization during his 14 months on the job than most CIOs expect to deal with in an entire career. In April 2001, Ford guided his organization through a merger with TWA in the largest airline integration in history. Last fall, the sale of Sabre to EDS meant that American Airlines lost almost 4,200 longtime contract employees. And after Sept. 11, Ford had to help his staff support the airline's IT needs as they and the company were rocked by grief and loss.

Through each challenge, Ford kept one idea in mind: The people on his staff are his single most valuable asset. To succeed as a leader and to keep his people's spirits up, he learned to adjust the way he viewed his employees.

"You have to treat your staff as though they're volunteers, not paid workers," Ford explains. "You have to do something every day that will make them want to come to work. IT people are smart; if you treat them badly, particularly during tough times, they'll remember. If you treat them well, they'll be loyal and stick around. If not, they'll leave for a better place as soon as they can."

As part of his philosophy, Ford has instituted a system of rewards and recognition. If someone has worked all weekend to finish a project or has done something good for the department, Ford personally applauds them. He and his managers also praise the staff on an individual and team basis once a week during staff meetings.

"Appreciate your staff as much and as often as possible," says the Wharton School's Klaus. "No matter how long they've been at the company, treat them like they're the best, the hottest stars in the place. Do whatever you can, even in small ways, through e-mails and meetings and one-on-ones, through small gifts or extra time off, to let them know you value them and the work they do."

For such efforts to be effective, they have to be genuine. While a keg party on Fridays or meetings with free lunches may seem like a quick way to make people feel appreciated and valued, if such activities don't fit into your IT culture, they can backfire, says Unifi's Holder.

"People don't stay for cheap tricks," he says. "They stay if the environment is supportive and challenging, the business is functional and there are positive working relationships."

The Morale of the Story

Bad morale is a very real, very serious problem that demands good leadership. The first step is to acknowledge the existence of a morale problem. If you make the effort to examine your management and communication skills and address a need for improvement, morale will go up and you'll find yourself with a loyal, resilient staff that won't bolt for the hills once the economy improves. **CIO**

Staff Writer Simone Kaplan wants her bosses to know that her morale is just fine, thank you. Share your strategies to improve your department's morale with her at skaplan@cio.com.

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How have you defined your IT culture? Consultant David Van De Voort will be online for the next two weeks to take your questions on improving departmental morale. Find him through **ASK THE SOURCE**, at www2.cio.com/ask/source.

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There was one sign over Cingular's door, but the company had a melange of call centers cobbled together through years of mergers. Here's how Cingular went from 60 specialized call centers to 20 new multifunction centers.

BY DEREK SLATER

Together

The advertising is so prevalent and the logo[✕] so recognizable—the little orange figure shaped like a child's jack—it's hard to believe that Cingular Wireless didn't exist until two years ago.

A massive media campaign is one of the benefits when you're the offspring of telco giants like SBC Communications and BellSouth, which knit their cellular operations together in 2000 to launch Atlanta-based Cingular. However, a single name does not a single company make. A customer moving from Sacramento to Wherever might find her interactions with customer service completely different—different agents following different scripts, an unfamiliar bill and so on. Cingular's set of 60 call centers were cobbled together by years of mergers and acquisitions.

That's par for the course in the wireless business, which started in the '80s under heavy regulation, with each market served by only two local carriers. According to Cingular COO Mark Feidler, when the spectrum licensing rules changed in the '90s, and customers started moving across markets with increasing frequency, the local providers were compelled to become regional, and then national. An M&A frenzy ensued. But the resulting morass of customer support facilities is no way to run a business when customer service is one of your main points of competition. "This is an industry with no intrinsic customer loyalty," says Carl Pitasi, a senior consultant with Compass America, a consultancy in Oak Brook, Ill. "A big part of your [profit and loss statement] depends on how long customers stay with you, and the quality of call center support plays very strongly into that."

Reader ROI

- ▶ See how to choose technology standards
- ▶ Discover techniques for merging multiple businesses into one entity
- ▶ Read a detailed study of call center consolidations



**COO Mark Feidler says that
when setting up call centers,
minimizing turnover while
controlling wages is vital.**

Merger Integration

Launching a national brand—that was the easy part. Behind the scenes, Cingular faced the task of rationalizing 60 call centers and 1,400 IT systems, including 11 major customer billing systems. Today—two years later—Cingular runs 20 brand-new multifunction call center facilities ranging in size from 600 to 1,200 agents. The 11 billing systems have been reduced to seven and will be down to two by the end of the year. The work isn't finished yet, but already the efforts are beginning to pay off. Cingular's centers handled 1 million more calls in 2001 than they did the previous year (as separate entities). Average call duration (a classic call center efficiency metric, since longer calls require more staff) was 30 percent lower in December 2001 than in December 2000. Internal quality measurements are also up, though Cingular won't quantify the rise. Here's a look at the challenges and lessons from the call center consolidation and the making of a single Cingular.

EXPERIENCE HELPS (AND YOU CAN HIRE IT)

Cingular didn't come to call center consolidation cold: SBC's wireless operations already had started efforts to consolidate some call centers, for example in the Great Lakes region after the 1999 acquisition of Ameritech. Kathy Dowling was president of SBC's Northeast region for wireless, where similar efforts had begun following the acquisition of SNET. When Cingular was forming, Dowling—with operations experience—was installed as senior vice president of merger integration.



Cingular Wireless at a Glance

CREATED: October 2000, by merger of wireless operations from SBC Communications and BellSouth

HEADQUARTERS: Atlanta

REVENUE: \$13 billion for 2001

SUBSCRIBERS: 21.6M as of Dec. 2001

EMPLOYEES: 35,000

I.T. EMPLOYEES: 3,800

COMPETITION: Number-two wireless carrier, behind Verizon Wireless

However, they still needed someone to head up the merger effort from the IT side. Shortly after the Cingular brand launch at the beginning of 2001, CEO Stephen Carter and COO Feidler decided to bring in a CIO from outside the company ranks. "It's important to have people who have come up through your own business," says Feidler, "and there's also enormous value in bringing in people from outside who bring a wealth of other experience."

The new CIO, Thaddeus Arroyo, had actually worked in telecom earlier in his career (at Southwestern Bell) but spent the past decade working on Sabre, the Dallas-based airline reservation system—most recently as senior vice president of product marketing and development, and before that he was senior vice president of IT services. Feidler says Arroyo's experience with large-scale systems, infrastructure plans, sophisticated routing and mission-critical call centers made him the top choice. He became Cingular's first CIO in February of 2001.

CREATE SYSTEMS BLUEPRINT AND CHOOSE YOUR WEAPONS

Arroyo's first action was to do an inventory of Cingular's existing potpourri of IT systems, which numbered 1,400 at that time. The goal was to select target platforms and systems to which the company would work to consolidate, with the usual anticipated benefits: lower costs, easier maintenance.

Arroyo says the process of choosing those technology standards is not a simple matter, particularly in the area of software applications. Obvious considerations include functionality and cost of ownership; often there is a trade-off between those two. Then there are further questions to answer: Which ones have custom interfaces that will need rebuilding? Where are the applications (and hardware platforms) in their normal life cycle?

Arroyo's group mapped its future requirements (based on information such as anticipated company growth, as well as desired additional functionality described by the business) and then created "decision matrices" to help weigh all the factors. Arroyo is willing to reveal some of the final decisions—for example, BEA Systems' WebLogic is the corporate standard for application servers—but says some choices are still in process, and others have not yet been communicated to the existing vendor base.

ENGAGE THE BUSINESSFOLK

A vital note: These standardization decisions weren't a case of "IT coming back to the business and saying, 'We've chosen this platform,'" says Arroyo. Instead, cross-functional teams composed of the affected busi-

CALL CENTER CONSOLIDATION TIME LINE

Cingular set an aggressive timetable for shuttering 60 disparate call centers and opening 20 new ones

EARLY 2000
SBC/BellSouth wireless merger negotiations begin

OCT. 2000
Call center consolidation begins with site selection

FEB. 2001
CIO Thaddeus Arroyo is hired

APRIL 2001
First new multifunction call center opens in Lubbock, Texas

APRIL 2002
20th call center opens in Lafayette, La.

SUMMER 2000
First meetings of Cingular leadership team

JAN. 2001
Brand launched in national media blitz

MARCH-MAY 2001
Systems inventory done; consolidation plans mapped

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nesses and lead by IT rated each option. The process has worked well; Arroyo says well over 90 percent of the initial system recommendations have been approved.

Business oversight of the call center migration undertaking went all the way to the top. Dowling's merger office provided project leaders and project managers. Project teams—which also included personnel from the existing call centers—reported back to Cingular's CEO, CIO, CFO and COO on a weekly and monthly basis.

THE BILLING CONVERSION EXAMPLE: MAKE HASTE SLOWLY

The most crucial pieces of software in the contact center arsenal are the customer care and billing applications. Mess up that migration effort and customers get messed up bills—a sure recipe for lost business.

No surprise, then, that the reduction from 11 billing systems to a single standard isn't

done yet. Arroyo describes the current state as an “intermediate convergence plan,” with all the new call centers running one of two systems by the end of this year. One is a packaged application from San Jose, Calif.-based Amdocs; the other is a home-cooked system.

Arroyo says the final jump to a single system is slated for 2003, but that last hurdle is the biggest, involving the most risk. Part of the holdup is the difficulty of defining billing system requirements three years out, as the wireless technology standard called 3G emerges. “Right now, as we look toward that end state, there are more unknowns than knowns,” Arroyo says.

Just whittling down to two systems was hard enough. Wireless companies have literally thousands of rate plans (varying by type of customer, geography, preferred calling patterns and discounts, and many other variables). To move customers from a given legacy system to the Amdocs application, for

example, the IT group looked at every function point and every rate plan in the old system to ensure they were accurately represented in the target platform. Any functionality gaps were closed. Next, IT ran identical data through both systems in parallel, and examined the output discrepancies. All discrepancies were fixed or satisfactorily explained. Next came massive migrations of customer data and historical account data from the legacy system, which took place two weeks prior to the actual system conversion date. After a final “go/no go,” the changeover occurred when IT workers switched all agent desktop devices from the old system to the new. (Even then, Cingular kept its legacy systems running for a few months after conversion, as a backup.) In a few cases, Arroyo says, the changeover date was pushed back, for example when call center agents required additional training before going live with the new system. But delays

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B usiness oversight of the call center migration undertaking went all the way to the top.

were brief and generally Cingular's billing system changeovers have gone according to schedule. Easing the consolidation challenge is the fact that all applications and servers are maintained centrally in Cingular's two data centers (in Atlanta and Dallas) rather than in multiple call center locations.

NO FLASH CUTS

Just as Cingular followed a careful process for gradually moving from one billing system to the next, the company's move from its old physical locations to the new ones was done gradually (rather than by "flash cut," turning one center off and the other

on at the same time). Cingular's name for this gradual movement is a tumble.

The new centers are located in less cosmopolitan areas: Lubbock, Texas; Ashland, Ky.; Ocean Springs, Miss. Feidler notes that location decisions are critical. Staffing is the greatest ongoing cost in call centers, so minimizing turnover while controlling wages is vital for efficient operation. Cingular relied heavily on a third-party site selection outsourcer to choose its new locales. Cingular's aim was to be an "employer of choice," yielding higher job satisfaction for its agents and thus for its customers. The first supercenters were built from scratch, but for speed and cost rea-

sons the later additions were frequently in abandoned Kmart's and similar facilities.

Old centers were kept online as the new ones came up, with calls sent to one or the other to keep the load balanced between the two while systems were tested, new employees were trained and the kinks were worked out in the newly opened facility.

That gave Arroyo some much needed flexibility when inevitable delays came up—sometimes over IT issues, sometimes not. He says telecommunications infrastructure proved the biggest headache. He attributes those challenges not to telecom provider problems but to the difficulty of anticipating Cingular's requirements for things like phone circuits.

"What makes it complicated is all the variables—Do you have your power supplies? Have the HVAC requirements been met so I can get my servers in the room on time?—many of them outside the control of the IT

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What makes call center consolidation complicated is all the variables—many of them outside the control of the IT department.

—CIO THADDEUS ARROYO

department,” Arroyo says. Again, the gradual tumbling plan provided some breathing room even as Cingular replaced all its call centers in less than a year.

DON'T STOP THINKING ABOUT TOMORROW

While Arroyo and company aren't finished migrating and standardizing, they nevertheless are moving forward with other, brand-new IT initiatives as well. “Wireless is a large business that's very complex at the customer level,” says COO Feidler. “IT in the long run

is one of the fundamental opportunities to differentiate yourself.”

One key project on tap is a move to a global routing infrastructure, which will allow Cingular to route a service call to whichever call center is best equipped to handle the issue—even if the caller and agent are entirely across the country from each other.

Another project is the construction of knowledge bases, which will further improve the speed and accuracy with which call center agents answer service questions.

Cingular hired 10,000 call center employ-

CIO.com

LEARN MORE: For insight into Cingular's consolidation, read an interview with COO Mark Feidler at www.cio.com/printlinks.

ees in 2001. As Feidler puts it, “When you're bringing together 10 or 11 companies, it's impossible to train everyone on all the subtleties overnight.” So Cingular's leadership team is excited about the construction of knowledge bases, which will give contact center reps more context for answering consumer inquiries than a simple script can provide. The knowledge bases will include neural network technology for intelligent sorting and searching of the information most likely to be relevant, as opposed to relying on simple keyword searches. The underlying technology is from ServiceWare of Oakmont, Pa. Twenty-five business analysts (not from the IT group) got underway early this year in capturing and analyzing Cingular's customer interactions to start building the knowledge bases, which will also be accessible through the Web for customer self-service.

Cingular (which spent all that media blitz money advertising the tagline “Express yourself”) isn't very expressive when it comes to revealing metrics and cost savings—for competitive reasons. But Compass America's Pitasi offers an interesting cross-industry perspective on the importance of systems standardization: Studying a decade's worth of banking mergers, Pitasi found that companies that “went like Sherman through Georgia” and forced acquired companies onto standard systems were usually able to continue to grow, while those that left disparate systems in place after an acquisition “were later acquired themselves, almost without exception.” Since Cingular's biggest competitor, Verizon Wireless, has undergone a similar consolidation effort, competitive pressure alone would indicate Cingular has taken the right approach to forging its business. **CIO**

Executive Editor Derek Slater writes about integration. Send him your merger stories at dslater@cio.com.

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FIVE UNEASY PIECES

CIO casts a skeptical eye on some of the most talked about tech trends

Reader ROI

- ▶ Learn why biometrics is still years from widespread use
- ▶ Find out what business process outsourcing really means
- ▶ Determine whether collaboration tools are worth the effort
- ▶ Discover how a computing grid may fit into your future
- ▶ See why open-source software is gaining respect—but slowly

It's amazing how the message never changes. Economy good? Buy more tech! Economy bad? Buy more tech! The sales tactics change a bit when budgets get tight, of course. But you can bet that a bevy of tech vendors is dying for a chance to show you their latest low-cost, high-value point solution that practically guarantees an instantaneous return on investment and lower total cost of ownership.

And that means it's a good time to revive *CIO's* Five Uneasy Pieces. Here we round up a quintet of hyped technologies and give you the lowdown on the problems, how the vendors hope to solve them and the facts behind the fiction. Whether you're contemplating biometrics, business process outsourcing, collaboration tools, grid computing or open-source software, we have some insights to share.

—Christopher Lindquist, technology editor

1

BIOMETRICS

Security at Your Fingertips

The Problem

CIOs realize that passwords are not enough to insulate their networks from hacks. Passwords suffer from two significant problems: Interlopers can easily guess them, and users frequently forget them. And studies show that providing the support necessary to get new passwords to absentminded users costs as much as \$300 per year per employee.

The Hype

Enter biometrics. Both the media and vendors have been showering this up-and-coming \$119 million market—which consists of face, voice, fingerprint, hand and eye recognition systems—with oceans of attention, according to Framingham, Mass.-based analyst firm IDC (a sister company to CIO's publisher, CXO Media). And unlike a password or key-card, users never forget their fingers, voices or eyeballs.

The Facts

Despite the hype, Earl Perkins, an analyst with Meta Group in New Orleans, says it will take at least another four years before biometric security solutions become mainstream.

"If you want millions of people using biometrics, all of the hardware manufacturers and all of the software developers have to agree on a specific programming interface. They've been working on a biometric [programming interface] for two years and are nowhere near agreement," says Perkins.

But the biggest challenge to biometrics becoming the mainstay of enterprise security is also the biggest headache for CIOs: the logistics and cost of putting a biometric solution on every desktop and laptop in the company.

"You have to recognize that having an IT person install the hardware and the software on a broad scale gets to be very expensive,"

Unlike a password
or key-card,
users never forget
their fingers, voices
or eyeballs.

says Chris Christiansen, program vice president of Internet infrastructure and security software at IDC.

And while biometrics has been in development for U.S. and European governments

for more than 20 years, it's still not perfect. Some systems are still difficult for humans to use, and they're subject to error.

While substantial challenges remain, some organizations are successfully using biometrics to crack down on fraud and safeguard sensitive information. For example, two nonprofit hospitals in Washington, D.C. (EMC Medical and MedStar Health), use iris scanning technology from Moorestown, N.J.-based Iridian Technologies to control access to patient data and restricted areas of the hospital.

"Since we put in our current system back in September, I have not seen a false rejection on anyone," says Craig Feied, director of informatics for emergency services at EMC Medical and MedStar Health. "The last thing we want is a security model that prevents patients from getting the care they need," he says.

—Meridith Levinson

2

BUSINESS PROCESS OUTSOURCING

Take My Process, Please

The Problem

You've got a load of noncore processes that you'd love to never hear about ever again. A plethora of vendors and consultants who are billing themselves as business process outsourcers are eager to help.

The Hype

If your core business is developing the most irresistible stuffed animal on the market, for example, why waste time and resources on such tangential activities as accounts-receivable processing or warehouse administration? You need them done, but it might make more sense to let an expert handle the tasks. Business process outsourcing (BPO) is the hottest thing on the sourcing scene right now. Gartner in Stamford, Conn., predicts BPO will be a \$300 billion market by 2004. And if you punch the term into a search engine, vendors boasting of BPO

prowess will literally spill off the page. When you really look at what BPO is—engaging a third-party vendor to handle an internal process you'd rather not waste time and resources doing yourself—you realize it's been going on for years. Just look at payroll processors like ADP. So what's the big deal about BPO?

The Facts

During the current economic slump, business-starved consultants have—in many cases—simply relabeled plain old outsourcing in order to hype a "brand-new" product for themselves. Worse, BPO's definition is often so broad that it becomes meaningless. "Depending on how you define [BPO], it can represent the entire economy," says Christine Overby, an analyst with Forrester Research in Cambridge, Mass. For example, a lot of companies offer "outsourced



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logistics" as an example of BPO. But companies have been outsourcing tasks such as outbound logistics for years to companies such as FedEx and UPS. Similarly, when asked to provide examples of BPO commonly in play today, John Hagerty, an analyst with AMR Research in Boston, included hiring a law firm to handle legal matters instead of having in-house counsel.

Others, such as Jose Cunningham, managing director of the Outsourcing Institute in

Washington, D.C., trim the definition to include only IT-intensive functions or processes like, say, benefits administration, call centers and contract manufacturing. But this still doesn't sound like anything particularly unique. In any event, Gartner Analyst Rebecca Scholl, who views BPO as a distinct, expanding market, acknowledges that a lot of the services that vendors are labeling BPO don't fit any definition. "Lots of vendors trying to reposition as BPO pro-

viders are just doing IT outsourcing," she says. "They're providing an application. They're not really responsible for a process."

So what's the take-away for CIOs? There's a definite payoff in engaging in many activities that have been labeled business process outsourcing. But don't go looking for a business process outsourcer—just define the specific process you want handled, and then find someone who can handle it for you.

—Eric Berkman

3 COLLABORATION

So (Un)Happy Together

The Problem

If you're going to have a truly integrated supply chain, one that allows you to see your partner's inventory while your partner is immediately aware of the demand on your end, you need tools to facilitate that high degree of transparency and connectivity.

The Hype

Collaboration tools are becoming a standard piece of the modern Internet, with everything from instant messaging for individuals to collaborative workspaces on B2B sites.

In theory, collaboration tools and practices allow every company involved to benefit from their business partners' product information—such as inventory, price and the manufacturing schedule.

The Facts

Soviet Communism worked in theory, and we all know how that turned out. In a sense, collaboration—in its truest cross-supply-chain form—strives for business communism. At the very least it requires companies to give up their greatest competitive advantages, the aforementioned information and knowledge. And that's assuming that the technological hurdles presented by a company's own systems can be overcome. Simple collaboration is happening. Jim Wicker, vice president of information tech-

nology for Dynamex, a Dallas-based same-day transportation company, collaborates with FedEx and other shippers through XML connections and Web interfaces. It's a good way to do business, but Wicker says that anything more than purchases and orders would require too many cultural and business process changes to be feasible. And this level of collaboration is an option only if a potential collaborator doesn't have information trapped in legacy systems. If your own systems aren't up to snuff, "what

is the point? Why should I open my kimono and show you my data when I know that my data isn't any good?" says Andy Macey, vice president of supply chain for consultancy Sapient in Cambridge, Mass.

Even if your data is in an easily exchangeable form, it probably isn't in an industry-wide standard format. Without standards, suppliers have to tailor their data to each business partner. And even if they could do that, letting their customers know how much they paid for a certain product, or how much they have in stock, flies in the face of accepted business practices.

—Ben Worthen

4 GRID COMPUTING

Grid and Bear It

The Problem

Most companies have scores of servers and desktop systems that sit idle much of the time. What a waste! Why not put those unoccupied processors to use on some of your biggest computing problems?

The Hype

IBM, Sun and other major vendors are all abuzz about grid computing. The basic idea of grid (a.k.a. "distributed computing" in its previous, more academic incarnation) is this: Tie many small computers together

and use them as a sort of supercomputer. Biotech and animation companies—both of which require massive computing firepower for gene sequencing and scene rendering, respectively—report early successes with grid technology.

In the long-term grid vision, users will be able to harness grid-computing power even outside their firewalls. Businesses will plug into the grid and tap that power—and pay for it—only as needed, just like electricity. Throw the light switch on, the juice starts flowing and the meter starts running. Turn



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The Facts

Critics of grid computing point out that interenterprise grids face considerable security hurdles (see "Power Pool," *Emerging Technology*, April 1, 2002). However, most companies will aim to build internal grids first, using only the resources behind their firewalls. Even there, most enterprises will have to wait for the maturation of another emerging technology—Web services—before grids can hit the mainstream.

The reason is simple: Most applications

were not written to run in a distributed manner. "Applications are the number-one barrier," says Songnian Zhou, CTO, chairman and cofounder of Markham, Ontario-based grid vendor Platform Computing. "Every time you shift architecture—mainframe to PCs [for example]—the apps you are going to use were designed before this era." In fact, the inability to break monolithic business applications into bite-size pieces is one of the hurdles that has kept the oft-promised mainstream arrival of massively parallel computing hardware—which effectively does in one machine what a grid does across many—out of the mainstream for decades.

Meta Group Service Director Nick Gall says there is progress. Web services offers a promising attempt at making applications more granular (see "Make Way for Web Services," at www.cio.com/archive). David Knight, vice president of applications and business services at Portera, a Web services hosting company in Campbell, Calif., says that's simply because developers are writing new applications from the ground up with the distributed processor model in mind. Still, it will take some time—perhaps a couple of years—for the vendors to recast today's commercial off-the-shelf software into a grid-friendly mold. —Derek Slater

5 OPEN SOURCE Open? For business?

The Problem

Windows is expensive; Microsoft is a monopoly (some say); Redmond makes apps for the enterprise, but not *your* enterprise.

The Hype

Linux has gained ground owing to well-publicized installations at companies such as Cendant, Dominion Resources and Schlumberger, plus backing from heavyweight vendors including IBM. Who knows what else open-source software can do for you?

The Facts

It's very difficult to find anyone who criticizes the technical quality of Linux. By all reports, it's at least as scalable and secure as Windows—if not significantly more so. Nevertheless, Linux still has a big hurdle to jump before it gets beyond niche status in corporate America. The hurdle isn't technical—it's perceptual.

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"There is a sort of stigma" attached to open-source software in the more conservative corners of the business world, says Michele Rosen, program manager at IDC. "In today's world, where people have so much information to process, preconcep-

think that's the major selling point for open source. The real advantage comes from the communal development process, which has yielded good, efficient code.

Apache's open-source program has surmounted the perception problem, accounting for more than half the Web servers in use today, according to oft-cited statistics compiled by Netcraft (www.netcraft.com).

The most commonly touted benefits of open source (it's cheap—and you can modify the code) are precisely what creates the poor perception. Modifying an operating system is the last thing most CIOs want to do.

tions can be a detriment," adds Rosen (who speaks positively about the actual quality of the software).

In fact, the most commonly touted benefits of open source (it's cheap—and you can modify the code) are precisely what creates the poor perception in some corners. Modifying or extending an operating system is the last thing most CIOs want to do. Actually, it is a bit of a red herring for conservative companies who mistakenly

But sneaking a bit of open-source software into the Web admins' server farm has proven easier than getting onto the servers and desktops running the ERP system. It's a task that Linux should prove equal to, given time, but the adoption rate continues to lag behind the hype. —D.S.

If you have your own candidates for overhyped technologies or processes, tell Technology Editor Christopher Lindquist at clindquist@cio.com.

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Retailers are looking to robust forecasting technologies to find upticks in the downturn

BY MERIDITH LEVINSON

During the boom-boom 1990s, the California casual dress style, popularized by legions of silicon-collar workers, conquered corporate America. Cadres of khaki pants strolled through office halls, and companies instituted casual Fridays. Executives took to the style, too, with Bill Gates, among others, appearing on TV looking very chino. And San Francisco-based clothing retailer Gap led the charge to outfit them all.

Sales rose (besting \$13.6 billion in fiscal 2000, up from \$11 billion in 1999) as Gap opened Old Navy, took its Gap and Banana Republic brands global and entered the Web channel. But it turned out that keeping up with demand patterns, planning the merchandise mix in all those stores (now more than 4,100 under three brand names) and determining when stores should receive shipments was a nightmarish task. Gap's sales continued to grow with its number of outlets into 2001, but net income dipped last fall as the economy entered tougher times, and red ink dripped. Gap posted an \$8 million net loss for 2001, and said it would close distribution centers in Kentucky and Holland.

2001 was Gap's toughest year. But long before reports of a big retail sector slump, Gap executives had committed to upgrading their ability to manage inventory worldwide. "We have a tremendous need to be more accurate in our planning, forecasting, allocation, pricing and optimization," says Ken Harris, Gap's CIO.

The retail industry has always been ripe for good forecasting technology that accounts for the thousands of products mass

Reader ROI

- Understand retailers' struggle to improve sales forecasts using IT
- Read how Sears uses long-range weather reports to stock shelves
- See how retailers use pricing tools to sell slow-moving goods



Gap CIO Ken Harris thought he could apply forecasting tools used by airlines to his 4,100 stores.

merchants carry, the myriad stores they operate, the impact of promotions on sales and the problems merchants can encounter with suppliers.

Retailers have collected vast amounts of point-of-sale data in data warehouses for years, but they haven't had the means to apply it effectively to their planning and buying because up until a few years ago, no computer or software application could process all of that data. The forecasting applications available today offer retailers better results because they incorporate more than just historical sales into their forecasts. Technology that in the past would generalize inventory needs across many stores now allows big-chain retailers such as Federated Department Stores to make sophisticated decisions about the needs of each of their outlets. "These new methodologies scale to handle much higher volumes of store SKU [stock keeping unit]-level forecasts, and they're also able to take into consideration a broader range of causal factors, such as price, consumer response and the promotional context of a sale," says Greg Girard, vice president of retail application strategies for Boston-based AMR Research.

That's not to say there's a fresh, clear path to profits in that traditionally brutal market. In fact, Bob Muller, vice president of inventory management at KB Toys in Pittsfield, Mass., says a new planning system that better spells out the needs of each of his company's 1,400 stores has definitely improved the allocation of merchandise. But external factors, such as consumer confidence declining after the Sept. 11 terrorist attacks, can make tabulating the benefits of forecasting a tough task. "With the recent events [of Sept. 11], it's obviously much more difficult to measure the impact on sales from the [calculations about] our inventory that we've done," he says.

Still, in a downturn, forecasting technologies are vital tools for retailers looking to stock their shelves to meet reduced demand. They help stores and warehouses carry less inventory and thus incur fewer costs. As the strategic investments by Federated, Gap,

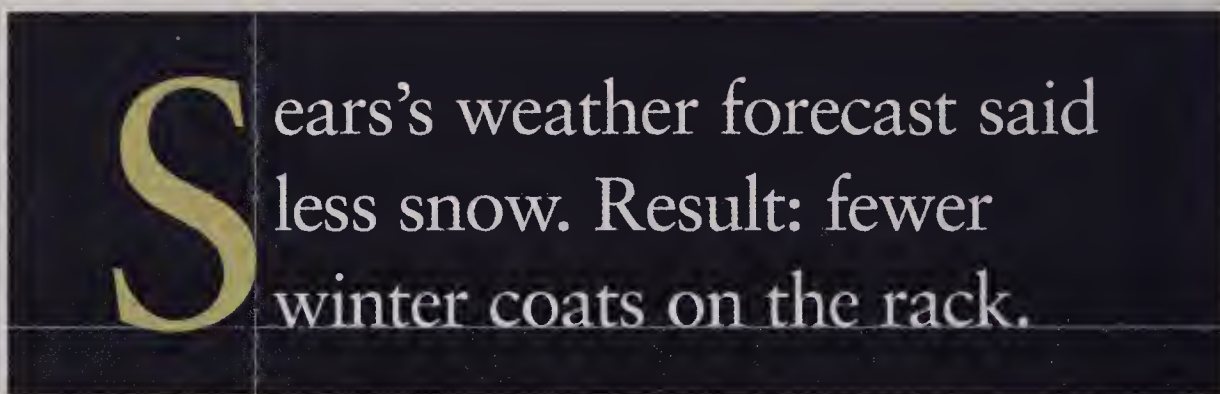
Sears and others demonstrate, retailers are digging in to fight for long-term gains. (For more on dealing with overstock, see "Everything Must Go!" Page 120.)

Filling in Gaps

AT GAP, CORPORATE BUYERS DID NOT HAVE A forecasting engine to crunch sales data and help predict how many boot-cut jeans to buy or how many would sell. Instead, Gap's planners and buyers had to gather current and past sales information from different, siloed planning and allocation systems and analyze it on their own—a slow and tedious activity—to determine what to buy, how

have a common set of tools for all activities across all divisions. It will integrate preseason planning activities such as determining how many faux-fur denim trench coats to stock in New York City stores with end-of-season activities such as clearance pricing. The tools also will help planners gauge shoppers' reaction to repricing items and speeding up or slowing down shipments of clothes, according to Michael Barrie, Gap's vice president of planning and forecasting systems.

And the new system will give merchants and planners visibility into each other's plans, into item-level and class-level forecasts, and into the financial pulse of the business, says



much to buy and when clothes should arrive at stores. Often data was duplicated among those different systems, which affected the accuracy of their forecasts and decisions.

Harris, Gap's CIO since September 1999, says he recognized that the planning and optimization tools used by airlines could help his company. His search for a system robust enough to handle all of the sales data from Gap's 4,000 outlets took until March 2001, when Gap began implementing planning and forecasting applications from Minneapolis-based Retek, a retail software vendor. Harris expects to be fully up and running on a merchandise planning and forecasting system as well by the end of 2002.

"We needed this ability to plan and forecast in the same tool, have visibility into our end-of-season and preseason planning, our inventory position, and be able to match that up very quickly to our receipt planning and make adjustments [as necessary]," says Diane Silver, Gap's vice president of IT.

With the system from Retek, Gap will

Barrie. He says that having that visibility will help merchants and planners make better decisions about what to allocate, when to mark down and how much to mark down.

"Every item in a store is an investment," says Barrie. "Given the size of our company, those are very sizeable investments, and we want to get the best possible return on each of those investments," he says. So if stores receive shipments too soon, then clothes remain on shelves longer and the company's inventory costs climb while its return on inventory investment decreases. "The better you can make [shipments] just-in-time, the higher your gross margin return on your inventory investment [will be]," says Barrie. Silver says the new system will forecast at a very detailed style-color level based on a whole series of factors such as how fast an item sells, the date it gets put on a shelf in a store and seasonal sales patterns.

Having an integrated system with "a single version of the truth," she says, will let merchants and planners focus on decision

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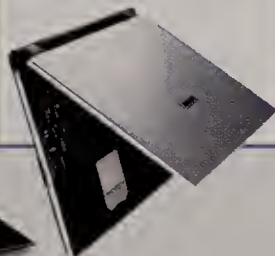
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making rather than gathering information from disparate systems. Also, merchants and planners entering the system through software on their desktops will be able to see the current status of each others' plans and forecasts. That visibility, says Barrie, will lead to better collaboration and decision making.

"It won't help us pick better product," says Barrie of the system. After all, buyers still have to have a keen sense of what's hip. "But it will facilitate more efficient decision making," he adds.

Better Than Your Average Meteorologist

TOUGH TIMES HIT SEARS, ROEBUCK & CO. last October. The 115-year-old company laid off 4,900 workers and announced it

would change the layouts of its stores to better compete with discount retailers. The company's 2001 revenues were down 3.6 percent from the previous year. Sears's CEO Alan Lacy promised to double his company's profitability during the next three years and reduce costs by \$600 million by ameliorating order management, using retail and warehousing space more efficiently, and by improving inventory controls. A weather forecasting application will play a critical role in executing Lacy's strategy.

Since 1995, Sears, based in Hoffman Estates, Ill., has received long-range weather forecasts from Planalytics, a Wayne, Pa., software vendor. Those reports complement other traditional planning methods such as economic forecasts, company decisions about

new or discontinued products, store openings and closings, and competitors' moves.

The weather becomes an important data point, says Jonathan Rand, director of merchandise planning and reporting at Sears. "If the weather impacts traffic in the store, it's going to impact your business," he says. Sears has added to its weather forecasts from Planalytics, a Web-enabled decision support tool from the same company that helps the retailer determine what actions to take to prevent overstocks and understocks based on the forecasts.

For instance, when Sears did its inventory planning for December 2001, it took into consideration that Planalytics had predicted that month to be warmer than normal in the Northeast. Indeed, during early De-

Everything Must Go!

Price optimization technology helps ShopKo move slow-selling stuff

EVEN WITH ROBUST

forecasting applications, retail managers live with the knowledge that not every decision will be a winner. So what to do when left with all those winter hats, mittens and scarves?

In July 2000, Green Bay, Wis.-based ShopKo Stores began piloting Markdown Optimizer, a price optimization application from Spotlight Solutions in Mason, Ohio. The idea: Determine the price at which slow-moving discounted goods will sell while still making a profit.

"Retailers tend to get hit harder when there's a turn-down in the economy. When that happens, there's a renewed focus in looking under every stone for ways we can optimize what we have today,"

says ShopKo CIO Paul Burrows.

Every season, ShopKo's 141 stores are left with excess seasonal merchandise that they relegate to the clearance aisle. The stores have a date by which they must sell all of the merchandise so that they can make room for new products.

Burrows says the goal with clearance merchandise is to get rid of the goods without giving them away. "The more you sell during the first markdown, the fewer are left even if you do have to take a second markdown," he says.

In the past, planners and buyers took on average four markdowns on apparel because they based their reductions on how similar products sold on clearance across the entire chain rather than at the indi-

vidual store level,

Burrows says. They might start with a

25 percent discount on swimwear, then three weeks later take a 40 percent reduction, then 60 percent until the last bikini was gone. It cost ShopKo 18 cents every time a store clerk marked a new price, according to Burrows.

Furthermore, the company was taking those markdowns on merchandise across the entire chain, regardless of whether the goods were actually selling in individual stores. That reduced the company's margins on that merchandise even more.

Though not perfect in its recommendations, Markdown Optimizer is a lot more scientific. Burrows says ShopKo



**ShopKo CIO
Paul Burrows**

feeds the application weekly sales data by store and by item from

its merchandise data warehouse. The application processes the sales effect of its past markdown recommendations and bases future recommendations on that data.

ShopKo saw a 24 percent increase in its gross margin dollars on the clearance items it tracked during the pilot. That's better than Burrows expects to see with a wider rollout. "We'd be happy if we were in the 10 to 15 percent range," he says. A 15 percent increase in gross margin would mean adding up to \$15 million to the bottom line on sales of \$100 million worth of clearance items. And that adds up to a lot of mittens and gloves. —M.L.

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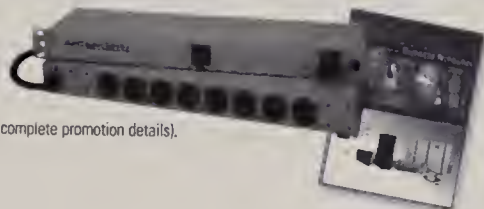
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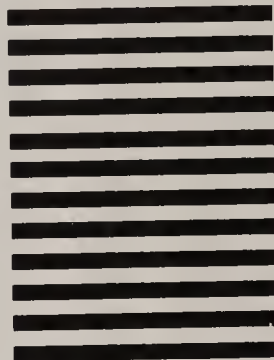
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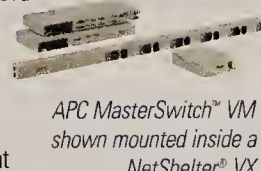
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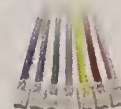
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cember in Boston, temperatures registered in the 70s. Planalytics also suggested that the milder weather would have a negative impact on the sale of winter coats. To mitigate that risk, Rand says, Sears decided not to buy as many heavy coats in order to avoid taking markdowns at the end of the season. He says the company also decided to change its assortment from heavy-weight wool coats to lighter-weight leather coats.

Rand says that Sears cut back on its inventory buys because of the weather forecast. Although topline revenue suffered as a result of those scale-backs, Sears's carrying costs were lower because it was holding less inventory. "Our overall profitability was better because we didn't have a lot to mark down," he says.

Merchandise planners also realized that the mild December weather would negatively impact the sale of snowblowers, an item the retailer sold out of during the winter of 2000. To boost snowblower sales, Sears advertised zero percent interest rates for six months on snowblowers on the front page of its Sunday circular during September. Sears bet that consumers would remember the previous winter and that they wouldn't want to be left in the cold sans snowblower. They were right. Snowblowers were the top-selling hardware item that month.

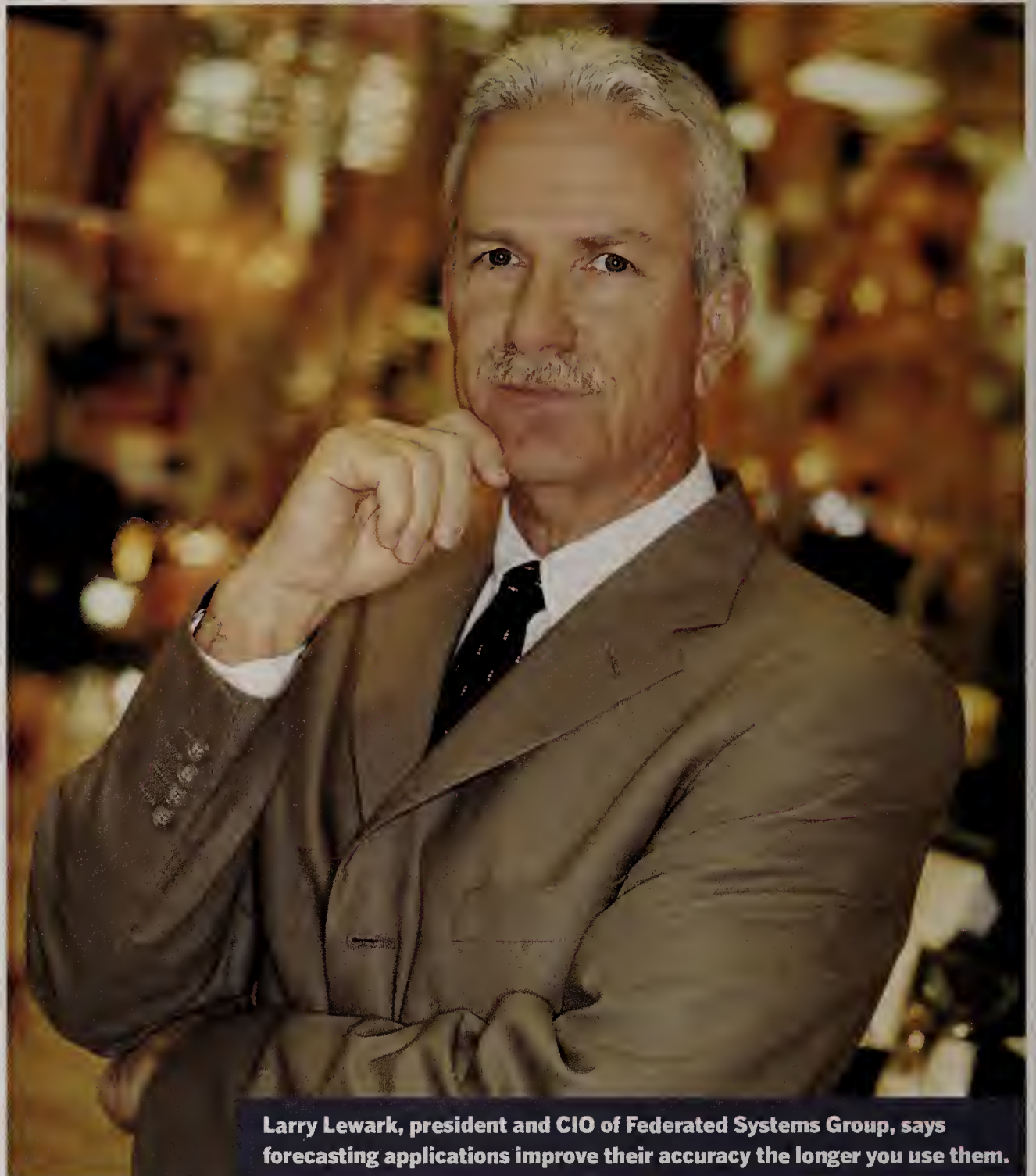
In the past, buyers used the average number of air conditioners Sears sold during a particular month in previous years to determine how many air conditioners to buy for the current year. Then they'd look at the federal government's long-range weather forecast or the *Farmer's Almanac* to get a sense of how the weather would influence consumer behavior. Rand says those forecasts weren't very accurate. Finally, the buyers would bet on the number of air conditioners they thought they'd sell. To make sure

they didn't run out of merchandise, Rand says, buyers would bring in products earlier in the season, even if the season was going to start later than normal. "If you know the season is going to start late based on the forecast, you won't bring in as much inventory as you normally would and therefore you won't have the carrying costs associated with that," he says.

Though the technology provides valuable information and insight, there's still the human factor: Buyers at Sears still have to make the final decision about what they're going to buy and how much. So even though the technology is accurate in its forecasts three days out of every four, there's still

margin for error. "Have we used it as well as we should? Absolutely not," says Rand.

Rand says the difficulty of using the tool lies in the sheer complexity of trying to predict sales. He also says that local store managers accustomed to using historical sales data to make their buying decisions are reluctant to start using a software tool—especially weather forecasts—when they are already familiar with the difficulty their local meteorologist has predicting weather for the next five days. To overcome that resistance, Rand says, he tracked its accuracy (74 percent correct during 2000) and shared those results with the merchants. "When you see how accurate it has been, people say, 'This



Larry Lewark, president and CIO of Federated Systems Group, says forecasting applications improve their accuracy the longer you use them.



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is darn good,' and then they start using it. That's what's happening," he says. Rand declined to share ROI figures but said the technology has more than paid for itself.

One Size Does Not Fit All

IT USED TO BE THAT CINCINNATI-BASED Federated Department Stores figured it had the formula for an ideal store. The model said that every Macy's should stock the same

Inforem. "Because automatic replenishment improves sales and inventory turnover of these basic items, we seek to have as many as possible on the Inforem system," says Larry Lewark, president and CIO of Federated Systems Group, a division of Federated Department Stores.

Lewark says the system delivers a cumulative benefit as Federated's employees gain experience with it. And additional product

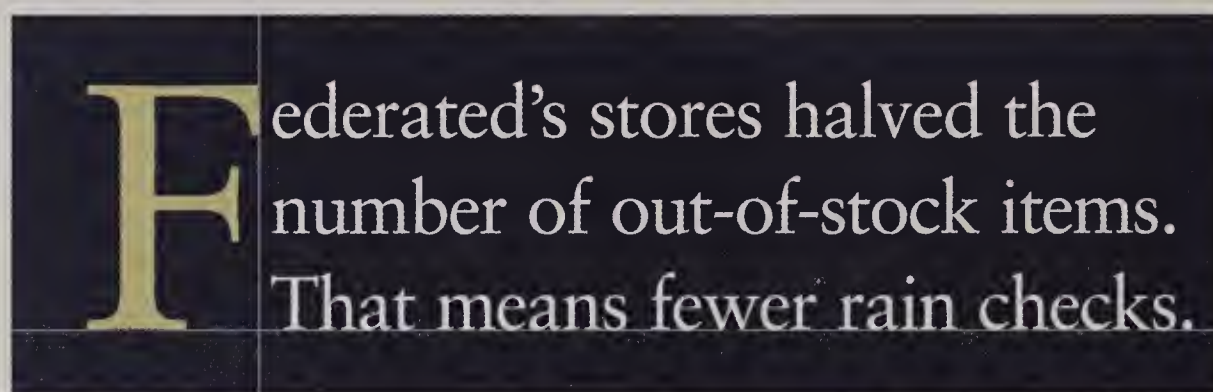
goods sold, then inventory carrying costs for Federated in 2000 are around \$1.6 billion, according to CIO's math. So if those costs can be reduced by more efficiently replenishing merchandise and lowering inventory, then Federated can free up millions in cash, says Andrew Macey, a supply chain consultant at Sapient in Cambridge, Mass.

Inforem further helps Federated minimize its inventories by sensing and reacting to sudden changes in the demand chain and by helping the company allocate its inventories more effectively. When women began regularly wearing pants to work, the system noticed a corresponding decrease in hosiery sales and a corresponding increase in sales of trouser socks. Inforem allowed the company to order more socks than panty hose from manufacturers to keep up with demand.

And that ideal store model is gone. Federated can be sensitive to individual store profiles and react to whether manufacturers such as Jockey can immediately ship panties to Macy's East's 100 stores. Further, when it finds out that a manufacturer is in short supply of underwear, Federated can select which stores to ship those coveted panties and shorts to based on data in Inforem telling merchants where the garments will sell the best. "We have each size of Jockey underwear in 400 stores across our company. The system is far better able to tell us which stores are selling which size and where to put that inventory than a buyer ever could manually," says Laurie Wilson, Federated's senior vice president of planning.

Though business was less than stellar last year (same-store Christmas sales dipped 8.6 percent, and 2001 operating income dropped to \$1.1 billion, about one-third lower than 2000), Lewark says Inforem helps Federated mitigate the effect of a recession on its business. "Without these systems, we would have more exposure to having the wrong inventory [in an economic downturn]," he says. They'd be buried in socks up to their underwear! **CIO**

Senior Writer Meridith Levinson (mlevinson@cio.com) covers B2C e-commerce and retail for CIO.



number, say six, of a certain style of men's shirts and keep those levels consistent throughout the year. The systems in place regularly reordered 10 percent of staple items such as socks, underwear, hosiery, cosmetics, men's dress shirts and cookware.

It didn't work. Sometimes, consumers couldn't find items they wanted and Federated lost potential sales. Other times, goods sat vigil waiting for shoppers who weren't interested, and Federated wasted money on unproductive product displays.

"Six is not the right number [of shirts] 52 weeks a year. Our business has peaks and valleys," says Gale Weisenfeld, vice president of retail technology at Federated Merchandising Group. Federated needed a system that reacted to those seasonal changes in demand and that could handle a larger number of items for its more than 450 stores, which include Bloomingdale's, Burdines, Goldsmith's, Lazarus, Macy's, Rich's and The Bon Marché.

In 1995, Federated Department Stores began running an Inforem replenishment system from IBM that is now owned by i2 Technologies. Today, 30 percent of Federated's total sales are generated from basic items that are automatically restocked using

sales history makes forecasts more accurate going forward.

Inforem has halved the amount of items that are out of stock each month, from 10 percent to 5 percent. In other words, now 95 percent of all merchandise managed through the Inforem system is on the sales floor each month. Having less out of stocks means more boxer shorts and high-margin designer moisturizers are being sold.

By looking at demand in real-time, Federated can replenish in real-time rather than order backup to a certain number, says Lewark. "If your second order can be for four rather than 12, you get a much more efficient use of that inventory dollar. The investment in inventory comes down the faster you can turn your products. Turn is everything to us. We constantly look at the turn of merchandise and what's the optimal turn we can get in our inventory," he says.

Since inventory carrying costs account for approximately 15 percent of the cost of

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Case Files: The Naval Sea Systems Command

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Building a Better Battleship

The Naval Sea Systems Command finds the best approach to knowledge management is one step at a time

BY STEPHANIE OVERBY

THINK YOU'VE GOT procurement problems? Try buying battleships. The Naval Sea Systems Command (NAVSEA), which engineers, builds and supports the entire U.S. Navy fleet, manages more than 130 acquisition programs worth about \$20 billion a year for everything from solid waste shredders to next-generation nuclear aircraft carriers. Yet NAVSEA historically had no established rules for running those hundreds of programs. And during the years it takes to build, say, a ship or a submarine, NAVSEA invariably lost many of its employees to retirement or new tours of duty. Out went the experience those employees gained about the acquisition process and in came increased time and costs to re-create that knowledge.

In 1999, NAVSEA began to look for a solution to its problems and found an answer in the form of a knowledge management database of acquisition best practices. But getting the database was only one challenge for NAVSEA, head-

quartered in Washington, D.C. NAVSEA had to get its 45,000 team members working around the country to participate in the new KM system. Given that the Navy's culture emphasizes internal competition rather than cooperation, instilling the need to share information was a tough roadblock.

But NAVSEA did eventually win over many of its workers with the benefits of the acquisition knowledge database. And in the process, NAVSEA developed its own best practices for knowledge management implementation: Take it slow and show people why it pays to share.

Shape Up or Ship Out

The origins of the acquisition knowledge database go back to the Clinton administration. Tom Eden, then-director of NAVSEA's Acquisition Reform Office, and others in the armed forces were charged by the former president to improve the way they bought things. Acquisi-



PHOTO BY KATHERINE LAMBERT

tion at NAVSEA is a protracted process—building a ship or a high-tech warfare system takes several years. And once a ship or system is delivered, the cost to operate it is roughly 80 percent determined. So in an effort to cut costs and reduce the number of sailors required to operate a ship or system, the Navy wanted to focus on the way its products were made much earlier in the process. “We wanted to make sure we were

getting what we wanted along the way, rather than waiting until we get the product years later,” Eden says.

Eden oversaw the acquisition reform process that aimed to reduce the money and time spent to get a product to the fleet. As part of that effort, Eden sought to introduce a set of best practices for NAVSEA acquisitions. In the past, if one of NAVSEA's buyers in Rhode Island wanted to learn about

“What KM had wrought was a vastly improved, easier way of getting the business done. It was a great morale booster and the single greatest factor in marketing KM to employees.”

—TOM EDEN, DIRECTOR OF NAVSEA'S
ACQUISITION LOGISTICS DIVISION

the purchasing process, Eden would fly in an expert to conduct a workshop in person. Wouldn't it be better, Eden thought, to instead provide continuous access to expert knowledge?

At the same time, NAVSEA's leadership was concerned about the maturing workforce. The average age of department employees was late 40s, which in Navy terms is near retirement. There was concern about all that knowledge walking out the door, even in the civilian ranks, according to Eden. “We needed to make sure that the knowledge that supported the NAVSEA structure was preserved,” he says.

Not Another Data Dump

Previously, knowledge management at NAVSEA and elsewhere in the Navy consisted of throwing together websites, an approach Eden knew didn't work. “They were a place to dump data, but they didn't preserve any knowledge,” he says.

So Eden and his team began to work with consultants at AMS, a Fairfax, Va., consultancy, to figure out a better KM battle plan. First they defined the processes within NAVSEA that needed to be captured in a virtual knowledge management environ-

ment. "We sat people down and said, 'We're going to look at where information comes from and start mapping how it flows at a gross level so we can get an idea of how the entire acquisition process works,'" says Eden. He met with individual practitioners in NAVSEA to come up with a list of 16 best practices they wanted to safeguard, including the total ownership cost process (the means of determining the life cycle costs of a ship and methods for reducing those costs), the commercial acquisition process (defining the policies and procedures for buying off-the-shelf items) and the acquisition reform process itself.

The list complete, Eden then met once a week with six or seven employees involved with a particular business process and potential best practice in order to figure out how to translate that process for inclusion in the acquisition knowledge database. He and his team began with the best practices that NAVSEA management determined would have the greatest potential to improve the acquisition process. The first to go live in the knowledge database was Eden's own community of practice, acquisition reform.

The process to identify the best practices, prioritize them and take them online lasted from December 1999 until April 2001. The ultimate goal of the KM effort was to develop a library of best practices based on NAVSEA's acquisition life cycles—from setting standards, creating RFPs and awarding contracts to product delivery, deployment and decommissioning—that promoted an integrated approach to capturing, organizing, sharing and using acquisition knowledge throughout the organization.

Getting Their Sea Legs

Throughout the KM implementation process, Eden met with a lot of resistance. It was particularly difficult to get NAVSEA employees to change their view of knowledge from that of a personal asset to an organizational one. "When we started asking for the numbers and assumptions associated with a particular process, people would say, 'That's confidential,'" Eden says.

THE QUID PRO QUO OF KM

BY JERRY ASH

IT IS FORTUITOUS that the Naval Sea Systems Command (NAVSEA) gravitated toward knowledge management while developing its best practices database because the freeze on funds now need not stall the initiative. On the contrary, it may well allow time to shift the emphasis from database construction to creation of a knowledge-sharing environment that will effectively use it. The key to a successful database is data use.

It appears that NAVSEA recognized human, Navy and bureaucratic culture problems only after it decided at the top what it would do; and then it met with small groups to figure out how to do it. That's a classic KM mistake. Resistance should have been gauged and dealt with long before the executives set sail.

That's because knowledge work is a grassroots activity, even in the Navy. A database can capture 20 percent of what employees know. Any directive to "do it the KM or Navy way" will result in only a fraction of that. It's not so much what's in the desk drawer that's at issue; it's what's in the mind. Hence, in order for KM to be truly effective, employee buy-in has to be considered from the start.

While a goal of the program is to retain knowledge as a hedge against turnover, the stakeholders need to be convinced that they are not giving it away. Rather, they are offering their knowledge in return for a share of others' knowledge. The combination will make them more informed and better candidates for commendation and promotion. To get employees on board, NAVSEA should assure them that use of the database will lead to career development.

Like many organizations, NAVSEA seems to believe that employee turnover is all detrimental. In a true knowledge-sharing environment, the constant turnover in employees can be a gain as well as a loss. New employees will bring new knowledge and innovative ideas to the teams. Old knowledge will blend with the new (in minds as well as computers) before people move on. Organizational knowledge then becomes dynamic and ongoing.

Seen in this way, the project is not incomplete. It has breathing room to grow.



Jerry Ash is founder and chief executive of The Association of Knowledgework (www.kwork.org), a Web-based group composed of people from 90 countries who are engaged in knowledge work. He can be reached at jash@kwork.org.

"Because of the culture of the Navy and the culture of bureaucracy, people were reluctant to take something out of their desk drawer and put it where other people could access it." After all, NAVSEA and the Navy's other commands were set up with creative tension in mind. If the executive program office for aircraft carriers seeks money for the new *USS Ronald Reagan*, it's in compe-

tition with the executive program office for submarines looking to requisition a new Sea Wolf. As a result, both sailors and civilians working at NAVSEA associated privately held knowledge with influence. "It's not any different than many corporate environments where closely held knowledge is associated with personal power," says Ray Bjorkland, vice president of consulting services for

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Federal Sources in McLean, Va. "People think that knowledge is power, and if they share it, nobody will value them."

So Eden had to figure out a way to create a reward system for sharing knowledge. "We're very limited when it comes to doing that," he says. "The only big benefit we can offer is greater efficiency. We can make your work easier for you." Although that's often the only benefit that ultimately matters, it's tricky to convey. "When you're trying to introduce a knowledge management system, it's not just a matter of how you get people into the mode of sharing information," says

"What KM had wrought was a vastly improved, easier way of getting the business done. It was a great morale booster and the single greatest factor in marketing KM to employees," says Eden. "Highly paid NAVSEA analysts were able to do what they were paid to do and wanted to do—analyze and think—versus doing secretarial work, running from one meeting to the next, trying to make sense of run-on conversations and constantly answering the same questions over the phone."

For those still reluctant to climb aboard, Eden took a more hard-line approach.

hard to justify and quantify IT investments in a top-line organization like the Navy where funds are appropriated by Congress," says Bjorkland. "And in the military, you can't necessarily see benefits for months, years, even decades."

Although NAVSEA continues to work on getting the remaining nine best practices into the acquisition knowledge database, the executive committee has frozen any further expansion for now. "It's too bad because it's a great way to do business," says Eden, who has moved on to become director of NAVSEA's acquisition logistics division. Although Eden says the benefits were clear in terms of time saved, e-mail reductions and meetings avoided, they were never quantified. "We were at a point that the savings were evident to the community members and to leadership, and that seemed to suffice," he says. "In hindsight, perhaps we should have methodically captured the savings in the interest of gaining a firmer commitment to doing the things at the corporate level to grow KM."

But Bjorkland thinks the knowledge management movement at NAVSEA and elsewhere in the armed forces will continue to advance, if only little by little. "Even if you start with baby steps, unless you can figure out a way to leverage it at the highest levels of the organization, it will be a slow process," says Bjorkland.

Even though the acquisitions knowledge database hasn't progressed as hoped, Eden is certain that it represents the future for NAVSEA. "It's the path our business must take, and I think there's a tacit acknowledgement of that by top management," says Eden. "I believe it will be given renewed emphasis eventually, maybe by a new generation who knows that a virtual environment is just as real as a plane trip to see the customer or a packet of papers you can hold in your hand." **CIO**

"Some people were closefisted about their knowledge. But in the end, they had to give it up."

—TOM EDEN, DIRECTOR OF NAVSEA'S ACQUISITION LOGISTICS DIVISION

Bjorkland. "It's how you demonstrate to them that sharing information will make their life better. You have to show people who are holding information that if they begin to share it, it will relieve them so that they can do even grander things."

In order to exhibit those benefits right away, NAVSEA went about its KM program one best practice at a time. "Our main objective was to give immediate value to what our team members were doing right then—immediate value to the business process," Eden says. "So we had to say, 'We're going to take this one part of what you do and show you value very quickly.'" For example, members of one group working on total ownership costs concluded that an important monthly report was a good candidate for improvement. "They used the electronic environment we had prepared to request inputs for the report, comment on the data through discussion threads, and edit and issue the report. In the process, all that history was systematically stored so the next time the report would be even easier to create." Before, the report was created laboriously via e-mails and in-person meetings, and it involved stacks of paper and mail.

"Some people were still very closefisted and guarded about their knowledge. But in the end, they had to give it up because there was going to be no other way of doing business with everyone else," Eden recalls. "We had to say, 'This is the way we're doing things now, and if you want to accomplish what you have to do, you're going to have to give that piece of information up.'"

Winning Battles, not the War

So far, NAVSEA has been able to implement about seven of 16 best practices in the acquisition knowledge database. NAVSEA leadership gave Eden and his team money in phases, based on how the project was progressing. But last spring, when then-CIO Jill Garcia made the case for more money to complete and expand the project to the executive steering committee and NAVSEA's commander, Vice Admiral G.P. Nanos, she met with resistance. NAVSEA had spent about \$65,000 on each best practice that went into the database. After spending nearly half a million dollars, executives began to squawk. It's an issue that plagues KM efforts at any organization that doesn't have a bottom line. "It's

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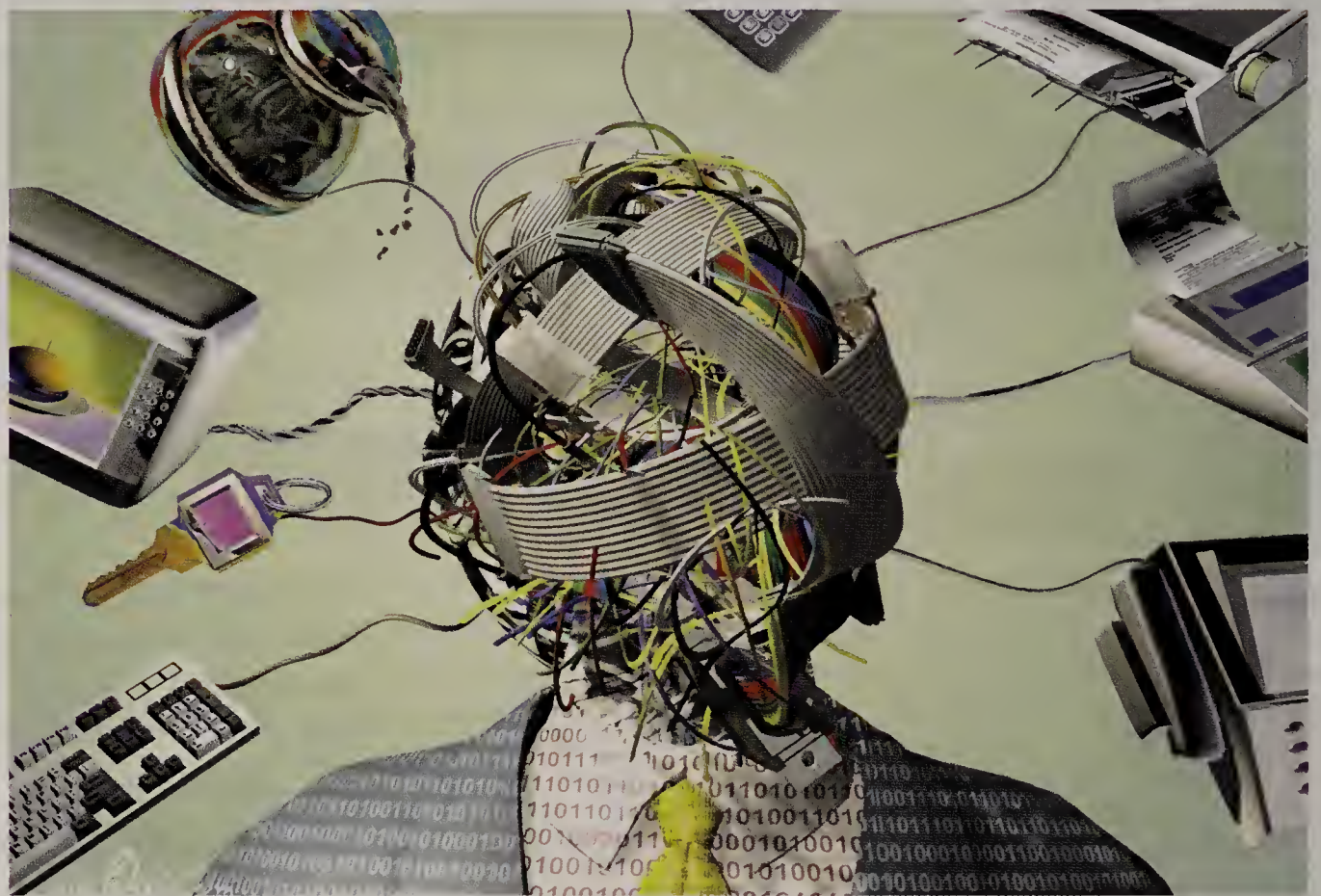
Companies to Watch

Talaris—making
arrangements 140

Pundits

Jim Jones on future
cyberthreats 142

*Edited by Christopher
Lindquist. Send your
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Universally Connected

Thousands of “dumb devices” are coming to a network near you

BY FRED HAPGOOD

THE GOOD NEWS for CIOs is that there is no mystery about the next big step in IT. However much fog there might be around biotechnology or robotics or nanotechnology, virtually no one would disagree that during the next few years

hordes of so-called dumb devices are going to find their way onto corporate networks. In the short- to mid-term, this influx may very well overwhelm the resources of the average IT office. And in the long-term, for better or

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worse, the situation could change IT beyond all recognition.

There are two classes of dumb devices: sensors (such as cameras, microphones, counters, meters, scanners, scales and position sensors), which measure physical changes; and actuators (motors, lights, switches, valves, manipulators, displays,

in Kentucky networked its printers (using digital printers from Xerox), allowing users to drive print jobs to the most efficient and convenient printer for each job. According to Ronald L. Moore, vice president of IT at the university, the returns were immediate (at least \$500,000 a year). "The more

stand they need it," he says. "A class in using the phone tends to get skipped." (Louisville's Moore makes the same observation about training for networked printers.)

User Input

Until now, most devices have been monitored or controlled by a single type of user; for instance, security personnel watched security cameras. Connecting devices to an enterprise network could give every constituency in the enterprise access, letting IT departments build a host of new applications around the same peripherals. In the case of security cameras on a retail floor, for example, marketing might use the feed to see which product displays attract traffic, and personnel could watch video to select candidates for extra training.

Those tempting attractions explain why research companies such as Harbor predict that by 2010 more than 40 percent of all potentially networkable electronic or electromechanical devices will be connected. Cambridge, Mass.-based Forrester Research reaches similar conclusions, predicting sales of 14 billion network-enabling chips by that year. In short, in a few years networks will start to be primarily about communication among devices, not among people.

This change implies a radical transformation in how we will configure and manage our networks. Bill Peisel, CTO of NetSilicon, a device connectivity vendor in Waltham, Mass., suspects many of those networked devices will be communicating directly among themselves, making peer-to-peer a more common communications model than client/server. And security will be more about good authentication than good encryption. "It's not that important to encrypt the room temperature," Peisel says. "It is important to deny access to the 13-year-old who thinks it would be really amusing to turn off the heat in the middle of the winter." Device-oriented networks

The primary benefit of wired devices is that they communicate or connect with just the right person at just the right moment.

loudspeakers, printers and locks), which impose such changes.

The primary benefit of connected devices is that they can communicate or connect with just the right person at just the right moment. Instead of maintenance technicians visiting each machine on a set schedule or checking every machine during a down period, networked sensors could send specific maintenance requests ("Water line three has a leak," for example) to the best technician for that particular job, ensuring that every visit has a payoff.

New Feature; Less Money

When David Graham, director of IT operations at Vignette, a content management services provider in Austin, Texas, installed network-monitoring devices (from NetBotz) that were themselves networked, he was able to patch facilities management right into the heat sensors. "It took a bit of the pressure off us," he says, noting that facilities management could now monitor the sensors directly. Previously, someone in IT needed to make a phone call whenever anything started going wrong.

Recently, the University of Louisville

people on a network, the greater the synergy," he remarks. "Standalone devices are inherently less efficient—they are usually idle 95 percent of the time.... Standalone devices will always be necessary, but they should be the exception, not the rule." His experience is not unique. Harbor Research, a Boston-based strategic consultancy, reports that device networking initiatives typically pay for themselves within two years or less.

Device networking also leads to more flexible services, because networked devices usually offer more powerful features and interfaces than standalone models do. Don McGill, director of voice engineering for CNET Networks, the San Francisco-based technology news company, recently moved company headquarter's phones onto the internal corporate network in order to add new features, such as call history management, which lets users quickly look up and recall previously connected numbers. However, he cautions that it can be frustratingly difficult to get people to understand that they really do need training to get the most out of networked devices. "If you announce a class in Java programming, people under-



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will probably need to be more robustly provisioned, and require redundancy and higher levels of automated maintenance built in at every level.

"We can lose a patient in seven seconds," says Reza Sharafi, a product support engineer at Welch Allyn, a medical diagnostic, lighting and data-collection manufacturer in Skaneateles Falls, N.Y. "If the network goes down, we lose everything. We don't want to hear that we can 'just reboot.'"

Device-oriented networks may well make it more difficult for companies to determine who will pay for what devices and network services as well. If security is perfectly happy with the old cameras, for instance, who pays for the new networked models? Suppose security needs

Will CIOs have to learn more about field operations or will field managers have to learn more about networking?

Device networks also seem to increase the pressure for upgrades. When everyone can access all the printers in an enterprise, users who were once happy with the machine in their office start to send work to the most advanced model available. When five different departments suddenly find their hands on a device, like a security camera, originally designed for just one user type the natural next step is to tell IT which new models are ideal for each user.

Management Makeover

It also seems unlikely that the management structures that worked when the

"We are now at the point where we can network individual gears and bearings."

—Joe Carpenter, president and CEO, Swantech

to store the video feed for only 24 hours, but marketing and HR want to preserve it for months? Who gets billed for storage? Who will be responsible for supporting the software that will implement whatever bookkeeping formulas emerge from all these complex usage patterns? How will priorities be set in a time when dozens of devices are waiting to be connected? When heating, ventilation and air-conditioning (HVAC), for instance, becomes a network device, IT issues such as network security and provisioning will affect the heat, and facilities issues—such as maintenance—will have an impact on the network. How will that be resolved?

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ratio of connected entities on an enterprise backbone to users was two or three to one will be as useful when that ratio is 10 or even a hundred times higher. "We are now at the point where we can network individual gears and bearings," observes Joe Carpenter, president and CEO of Swantech, a Fort Lauderdale, Fla., company that makes networked diagnostic equipment for industrial machinery.

As the number of devices on the network increases, some observers suspect that field operations may start to take over the management of network issues specific to their jobs. Chantal Polsonetti of the ARC Advisory Group, an automation consultancy based in Dedham, Mass., points out that field and network people have different operating cultures. CIOs often come from a store-and-forward world in which fractions of a

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second don't matter that much, whereas in the world of physical devices—where functions can have safety implications—even small delays can have large consequences. While the technology could wait for backbone upgrades, Swantech's Carpenter argues that this delay is not necessary, since adding local resources can make devices smart enough to tackle many network issues on their own. Computation lets them model and then adapt intelligently to network behavior; local storage lets them take on responsibility for issues such as reliability (when the network goes down, device storage kicks in).

Another simple name for the transformation of dumb devices into smart devices is automation. As more devices get smarter, their ability to repair themselves will only increase, and the number of times when a network breakdown will require human intervention should drop. When that intervention becomes necessary, however, it will likely require the technician to have more skills and training to solve the problem.

In theory that seems like an ideal environment for the elaboration of a globally outsourced support model, having hundreds of thousands of superexperts—each deeply educated in a few specialized support issues—monitoring the device networks of clients around the world and dealing with crises as they erupt. In other words, the migration to device networking might shrink the number of routine IT support issues (through smarter devices and more local management) while outsourcing the remaining, tougher problems.

It would seem like a gloomy prospect for conventional IT workers, except for one consideration: The superexperts are going to have to come from somewhere—and IT may prove an excellent training ground. ■

Fred Hapgood is a freelance writer based in Boston. He can be reached at hapgood@pobox.com.



UNDER DEVELOPMENT

Global mobile phone

Phone Away from Home

A **MOBILE PHONE** that could be used anywhere in the world—regardless of the protocol requirements of local carriers—would be just the ticket for international travelers. That's what Bell Labs is aiming for with its new Common Operations (COPS) software architecture.

COPS is designed to provide global roaming access across all existing major network types as well as emerging third-generation technologies. The software can even work with 802.11 wireless data networks. "The architecture could be extended to include all mobile network types," says Jack Kozik, director of enhanced services architecture for the mobility solutions group at Murray Hill, N.J.-based Lucent Technologies, Bell Labs' parent company.

COPS is a "protocol gateway" that translates data based on various types of wireless standards into a single, common format. The technology provides an interface that draws information from home location registers (HLRs), the subscriber databases maintained by each carrier. When installed on a carrier's servers, COPS automatically generates subscriber authentication, authorization and location data from normally incompatible networks. It also works in reverse, sending relevant subscriber information back to the home carrier.

COPS acts like a multilingual translator. "The software takes data that might be ordinarily incomprehensible to a network and places it into a usable form," says Kozik. "It will allow users to take their phone and their services along with them wherever they may roam." On the subscriber end, all that's required is a dual-mode CDMA/GSM phone.

A pending crop of 3G wireless services, including instant messaging, streaming media and global positioning, promises to make the task of handling roaming subscribers much more complicated and expensive. COPS aspires to cut carriers' costs by streamlining the interchange of subscriber data. "COPS will require fewer boxes and fewer interconnections," says Kozik. The technology also aims to help carriers support multiple network types, or to migrate from one network protocol to another, without adding or converting HLRs.

Lucent expects to begin offering products integrating COPS architecture to its equipment customers late this year.

—John Edwards



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COMPANIES TO WATCH

Talaris

Making Time

Talaris looks to ease scheduling

BY SARAH D. SCALET

TALARIS doesn't want to be just the next best thing to a personal assistant; it aims to be better than a personal assistant. That's because employees themselves are always wanting *things*—time-dependent services such as conference rooms, flights and restaurant reservations, which might be arranged by an automated calendar inside the corporate firewall, a site on the public Internet or a hostess who answers the telephone at a small restaurant. "If this were nirvana, and corporate budgets were unlimited, any person who spends time away from the office would wind up with two or three administrative assistants who work around the clock," says Roman Bukary, Talaris's senior director of product marketing and strategy. But these days are hardly nirvanic.

That's where Talaris steps in. Named after Talara, the winged sandals of messenger god Hermes, Talaris's goal is to

automate the process of arranging those services. The company got its start when founder, chairman and CEO Patrick W. Grady was working at Portivity, a sales-force automation company. When he asked salespeople how to improve sales, what he heard were not suggestions about improving the product. Instead, salespeople wanted help with the secretarial tasks that occupied as much as a quarter of their time.

Grady and cofounder George Gould, now vice president of quality of service at Talaris, started to dream up a solution, and in June 1999 they founded the company. Privately held, Talaris has gone through three rounds of venture capital funding and hopes to break even "a few quarters out," Bukary says.

The trick to making Talaris work, of course, is in the execution. Using simple object access protocol (SOAP) and other

integration methods, the software must link suppliers and customers who may well have a vast gulf of technology between them. "We set out to build a technology that would allow the supplier to transact with Talaris without major IT expenses and that would allow the user to have an application that is seamless," Bukary says. "The user doesn't know how I talk to the supplier. I will deal with you as a user or you as a supplier at the highest level of sophistication you are capable of today." That can mean just a telephone, he says, and there's human fallback if the automated system can't schedule the service.

So far, Talaris has about 120,000 service suppliers as well as a partnership with Sabre's GetThere, but it has very few installed users. Sun Microsystems, another partner, is rolling out the service to its first 300 users and hopes to save money on administrative overhead. "Success greatly depends on getting people's attitude changed about how they should go about procuring services," says Shahram Moradpour, senior director of market development at Sun. "But we're starting to get e-mails from people asking when are we going to get this thing rolled out? People want to use it."

Perhaps that's because, as Aberdeen's Dana Gardner sees it, Talaris has found a practical way of making Web services relevant. "People need a way of translating Web services into their daily routines. Talaris has created an engine to allow people to be reached through the devices of their choice, and that's pretty cool," says Gardner, research director of messaging and collaboration services.

The flip side is that some application vendors may be leery about losing the primary relationship with the user. "What we have here is a balancing act, in that Talaris can act as a catalyst but is going to extract a toll—a piece of the relationship with the customer," he says. "And that's kind of an interesting business model. It's blazing a trail for how a Web services economy might operate." ■

watching...

Talaris Corp.

Headquarters San Francisco

Founded 1999

Employees 75

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PUNDITS

Jim Jones

The Internet Is a Zoo

Sharing information is the key to keeping ahead of cyberattackers

IMAGINE this scenario: A talented programmer has a cool idea. The programmer codes a prototype in a few days, the prototype is reviewed and improved by a collection of the best programming talent on the globe, and a robust final product is released less than a week after the birth of the idea. Further, the product undergoes a continuous revision, improvement and release cycle, always including the latest and greatest techniques from a tireless worldwide team of talented programmers. Dreamland? Hardly—this scenario is taken from real life. But before you dust off that killer app proposal, call the venture capitalists and order the Mercedes, professional ethics obligate me to tell you that I'm talking about the world of Internet worms.

The recent history of worm attacks provides a diversity that Darwin himself would have appreciated: L10n attacked Unix systems with a single exploit. Ramen attacked Unix systems with multiple exploits. Sadmind/IIS was multiplatform. Cheese was a "good" worm. Code Red exploited Internet information server vulnerabilities and was actively modified and rereleased. Nimda expanded Code Red's exploits, infected clients as well as servers and modified the scanning algorithm. Leaves attacked already compromised systems and could be updated and controlled remotely. And a slew of worms used e-mail to propagate.

As if a quick and creative worm-writing community wasn't threatening enough, two factors make me believe the storm has yet to hit. First, clever ideas are circulating in public forums and have not yet been successfully implemented in a widespread worm. Here are a few examples.



Reacting quickly to new threats requires a robust information-sharing and analysis network.

- Abuse of trust relationships, like instant messaging systems and peer-to-peer file sharing applications; why break a window when your victim invites you in?
- Scalable remote control of compromised systems; Internet relay chat (IRC) is the de facto control mechanism (bad guys can use the chat channels to issue system commands), but it has its limitations.
- Lightweight worms that download updated or specialized code from other

servers; Leaves tried this in a limited sense, but the possibilities are much broader.

- Incorporation of "zero-day" exploits; if someone burns a zero-day (an attack as yet unknown by the public) on a worm, expect it to do more than spread and deface with a harmless pseudopolitical message.
- Stealth spreading and infection; current worms are as subtle as your e-commerce Web server crashing, but new worms will tiptoe in and hide in the shadows.
- Polymorphism (code that changes every time it propagates); existing worms are easy to recognize, but polymorphic worms are well-disguised.

Second, the less creative (and usually less skilled) writers continue to package existing tools and techniques to create new worms. The combination of a lower skill requirement and larger target population means more worms that affect more systems.

We cannot eradicate Internet worms any more than we can eradicate biological viruses, but we will survive with a similarly mixed strategy of preventive and reactive defenses. In biology, we inoculate against known pathogens, react quickly when a new threat is identified and treat the patient once infected. On the Internet, inoculation equates to applying patches promptly, implementing sound perimeter security defenses and keeping virus definitions up-to-date. Reacting quickly to new threats requires a robust information-sharing and analysis network. Such a framework is emerging, and I encourage you to tap into one or more of the available sources (www.itisac.com, www.nipc.gov, www.sans.org and www.cert.org, for example). Finally, treating the infection requires a prearranged response capability, access to actionable intelligence about the threat (see the information-sharing sites, above) and an accurate picture of your operational environment and defensive options. **CIO**

Jim Jones directs the analysis group of Predictive Systems Global Integrity Unit, where he and his team forecast emerging techniques and attacks.

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Opinion

IN THIS SECTION

Reality Bytes

The ethics of CRM 144

From the Publisher

iMacs in the enterprise 148

Reality Bytes

A Cold Look at Hot Trends

Too Close for Comfort

CRM may be a marketer's dream, but companies should still pay heed to privacy and ethical concerns

BY ALAIN JOURDIER

WHEN MY WIFE SAW an ad for a new, less intrusive blood-sugar tester to help manage her diabetes (available free via a coupon at our local pharmacy), she snapped it up. She'll do anything to make a distasteful part of her life easier. What she also received in the bargain was an onslaught of very targeted direct mail and Internet solicitations from the manufacturer of the test as well as from several pharmaceutical companies.

As a marketer, I like the fact that I can get closer to my customers through CRM. And I'm well aware that people are willing to share even the most intimate details about themselves if they think they're getting something of value. CRM allows a business to have a dialogue with its customers, thus



creating an opportunity to solve problems expediently, identify needs, and increase customer satisfaction and revenue. It's the company's eyes and ears to the marketplace.

Yet as a consumer, I'm wary that every nuance in my family's private life is simply more marketing information in search of a perfect pitch. Old-fashioned notions of privacy, of course, have already gone out the window. The availability of information now in the public domain is staggering: From toll-free numbers to warranty registration cards to depart-

ILLUSTRATION BY GENE GREIF

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ment of motor vehicles records to catalogs and club memberships, information about most everyone is on a database in some form or another. The vast majority of solicitations from these sources are merely intrusive and not unethical.

Gray Ethics

CRM raises some disturbing ethical issues that fit into a grayer, more unregulated arena. These are issues that we as a society must grapple with, more so in some industries than others.

For instance, the pharmaceutical companies have done a stellar job of exploiting CRM. Before 1994, they spent less than \$50 million a year in direct-to-consumer marketing, but in 2000 they spent nearly \$2.5 billion. Above and beyond blanketing the broadcast and print media with advertising, pharmaceutical com-

risk because of previous credit problems or even a lack of credit. Those loans carry higher interest rates and fees and, in many documented cases, include unfair penalties and provisions. There have been instances where borrowers who own houses with equity could qualify for better terms yet were steered to the more lucrative sub-prime market.

A Higher Road

If we as a nation are really serious about curbing health-care costs, we should pressure the Food and Drug Administration into rescinding its regulation that permits direct-to-consumer marketing in the pharmaceutical industry. Medicare, Medicaid and health plans could also build in incentives for doctors who resist prescribing a new, more expensive drug when an older

and equally effective generic medication is available. Patient education is the key here,

Permission marketing is not a one-way ticket to exploitation.

panies are using CRM to hone their marketing messages to specific doctors and patients. Studies have shown that when patients go to a doctor and request a drug seen in an ad or a direct mail solicitation, almost half the time they will walk out with a prescription for that drug. A November 2001 study by The Henry J. Kaiser Family Foundation, a health-care research organization based in Menlo Park, Calif., found that of those people who talked to their doctor about a medicine they saw advertised, 44 percent said that the doctor gave them the prescription medicine they had asked about. Some observers say such direct mar-

keting to consumers is unethical because it usurps the prescription drug system and physician-patient relationship by directly targeting people when they are at their most vulnerable. It also puts tremendous pressure on physicians to prescribe drugs that are usually more expensive and not much better than older, generic medications.

Ironically, most of the health-care industry is lagging far behind in using CRM to manage customers effectively and better prepare patients to be wise consumers of its services. But the very strategy that is powering pharmaceutical profits could greatly enhance the physician-patient relationship as well as build customer affinity for local health-care providers. For instance, numerous studies have shown that people who search for health-related topics online are consistently less than satisfied because they would rather receive this information from their physician and local hospital—institutions they already trust and can access.

Health care is not the only place where ethical issues with CRM exist. In banking, lenders walk a fine ethical line when they target sub-prime loan borrowers who pose a greater risk because of previous credit problems or even a lack of credit. Those loans carry higher interest rates and fees and, in many documented cases, include unfair penalties and provisions. There have been instances where borrowers who own houses with equity could qualify for better terms yet were steered to the more lucrative sub-prime market.

As for my wife, she's a bargain shopper, and the privacy concerns I have don't bother her nearly as much as they do me. So long as she gets a bargain in the transaction, it seems a fair exchange. Go figure. **CIO**

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To read more on ethical issues surrounding CRM, visit the **CRM RESEARCH CENTER** at www.cio.com/crm.

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Do you think companies blur ethical boundaries in their use of CRM? Let Megan Santosus, senior editor of Opinion, know at santosus@cio.com. Alain Jourdier teaches health-care marketing at the UCLA School of Public Health MPH for Health Professionals in Los Angeles.



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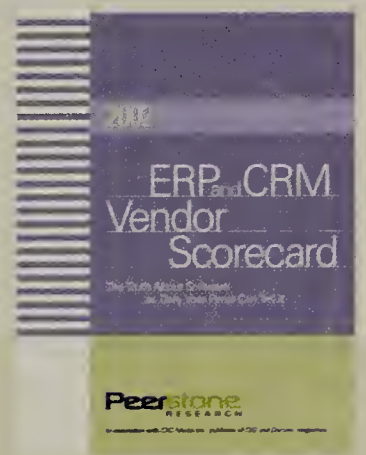
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An Apple for the Enterprise



Gary J. Beach

"IF YOU WANT to sell more computers to the home market, sell more computers to the enterprise market." That was how a Gartner research analyst answered an inquiry from a representative of a tier-three PC company in October 1995. Makes sense, doesn't it? If I stare at a Dell computer on my desktop all day at work, Dell will most likely be top of mind when I'm in the market for a home computer.

I was thinking of that Gartner moment when I visited one of those hip Apple retail stores and watched two IT professionals go ga-ga over the new iMac personal computer. I asked them what they thought of the machine.

"All things being equal," the first responded, "I would rather have an iMac on my desk than a clunky PC." Then the other IT pro chimed in. "But all things are not equal. We are a Wintel shop with no room for iMacs in our organization." Just before we parted, the first IT pro mentioned something about moving servers to a Linux environment. And that got me thinking: That's how Apple can make inroads into the enterprise market.

Apple should make a special iMac model for enterprises that runs a Linux client OS. In the process, Apple would increase its share of the home market as well. Efforts to make an advanced, easy-to-use graphical user interface for Linux—most notably

those made by former Apple software evangelist Andy Hertzfeld and Eazel's Guy Tribble—were ahead of their time. Eazel and its graphical file manager product called Nautilus failed because of market conditions, not product conditions. The enterprise was not ready for broad-based Linux in 1999 and 2000.

But thanks in part to the long IT spending drought, Linux's market appeal to CIOs and the enterprise is high.

Some say it would be fairly simple for Apple to get a version of Linux to run on the new iMac. The challenge remains in the graphical user interface (and all the back-office stuff like drivers, plug-and-play and networking). But it can be done.

Steve Jobs, if he is serious about making Apple into a feared technology power, should round up the old Eazel players, pay them hoards of money and announce the new iMac Linux machine at this summer's MacWorld Conference & Expo.

I wager there are millions—if not tens of millions—of former Mac users like me who would welcome the move. And buy more Macs for the office *and* home.

What about you? If Apple introduced a Linux iMac client, would your organization consider buying it? I look forward to your reply.



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Index of Companies and Advertisers

Page numbers refer to the first page of the article(s) in which the company is mentioned. This index is provided as a service to readers. The publisher does not assume any liability for errors or omissions.

COMPANY INDEX

Aberdeen Group Inc. 56, 132
Acsys Inc. 26
Airborne Inc. 56, 152
Akibia Inc. 56
Amdocs Ltd. 100
American Airlines 92
American Power Conversion Corp. 132
AMR Research Inc. 56, 109, 116
AMS Inc. 126
Apple Computer Inc. 148
ARC Advisory Group 132
Avnet Inc. 26
Battelle Memorial Institute 26
Bell Labs 132
BellSouth Corp. 100
Bradlee's Inc. 92
Cap Gemini Ernst & Young 56
Cendant Corp. 26
Cingular Wireless 100, 152
Clarify Inc. 152
CNET Networks Inc. 132
Compass America Inc. 100
Dell Computer Corp. 148
Dynamex Inc. 109
Eazel 148

ejTalk Corp. 26
Federal Sources Inc. 126
Federated Department Stores 116
FedEx Corp. 56, 152
Forrester Research Inc. 109, 132
Gap Inc., The 116
Gartner Inc. 56, 109, 148
Geekcorps 26
Group Health Inc. 56
Harbor Research 132
IBM Corp. 56
Intel Corp. 26
International Data Corp. 56, 109
International Speedway Corp. 56
Iridian Technologies Inc. 109
Jupiter Media Metrix 26
KB Toys 116
Kindred Healthcare Inc. 92
Lucent Technologies Inc. 132
Maximus Inc. 26
Meta Group Inc. 109
NetBotz Inc. 132
NetSilicon Inc. 132
Onyx Software Corp. 56
Oracle Corp. 56
Peace Corps 26
PeopleSoft Inc. 152
Planalytics Inc. 116
Platform Computing Inc. 109
Portera Systems Inc. 109
Portivity 132
Praendex Inc. 92
Putnam Lovell Securities Inc. 56, 152
RCA Corp. 26
Retek Inc. 116
Sapient Corp. 109, 116

SBC Communications Inc. 100
Sears, Roebuck & Co. 116
ServiceWare Technologies Inc. 100
ShopKo Stores Inc. 116
Siebel Systems Inc. 56
Sun Microsystems Inc. 132
Swantech LLC 132
Talaris Corp. 132
Tech Data Corp. 92
Trilogy 152
Tweeter Home Entertainment Group Inc. 92
Unifi Inc. 92
Vignette Corp. 132
Welch Allyn Inc. 132
William M. Mercer Cos. LLC 92

ADVERTISER INDEX

American Power Conversion 121
Avaya 33
Cingular Wireless 37
Cognos Inc. 59
Computer Associates Intl. Inc. 5, 104
Connected Corp. 61
Cross 90
Crystal Decisions 27
CXO Media Inc. 48, 108, 141, 145, 149
DataMirror Corp. 35
Enterprise Software HQ 129
Fujitsu 2
Gateway 137
Genuity 23
Harvard Business School Press 49
IBM Corp. 39, 54
Intel Corp. 97
ITworld.com 143

KPMG Consulting C3
Kronos Inc. 115
Lawson Software C4
Lockheed Martin 63
Michigan Economic Development Corp. 139
Microsoft Corp. 6, 24
NEC/Mitsubishi 10
Networked Economy Summit 151
Nortel Networks 113
Novell 123
Oracle Corp. 21
Panduit Corp. 131
Parametric Technologies Corp. 18
Peerstone Research 147
Princeton Softech 111
Qualcomm Inc. 95
Quantum Corp. 99
Qwest Communications Inc. 125
Red Hat/Compaq 103
salesforce.com 9
SAP 53
SAS 29
Secure E-Business Summit 89
Siebel Systems Inc. C2
Sony Corp. 51
Strictly Business Expo 133
Sybase Inc. 14
Synogy 17
Tallan 135
Toshiba America Inc. 119
Trend Micro Devices 41
Unisys/Microsoft 31
US Postal Service 47
Veritas Software 107
Xerox Corp. 13

the Honorable Tom Davis, Member of Congress

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EXECUTIVE Summaries

May 1, 2002

COVER STORY | CRM for Less

By Susannah Patton | 56

Ever since the economy dipped, the majority of CIOs making CRM investments are doing so incrementally. CIO research finds that 64 percent have learned to implement CRM projects in baby steps rather than taking one giant leap. For example, Airborne Express purchased a sales-force automation tool for \$3 million—half the cost of a full CRM suite. Other companies are foregoing the suite in favor of integrating existing systems with best-of-breed CRM tools. FedEx Services was able to integrate its sales-force automation application with its PeopleSoft ERP system, a sales compensation application from Trilogy and call center software from Clarify. A third way to acquire CRM systems faster and cheaper is the rental model. Investment bank Putnam Lovell Securities chose an application service provider rather than shelling out \$2 million to buy its own software. The ASP route has reduced the bank's total cost of ownership by 57 percent.

“The big CRM suite can be a disadvantage if you're paying for more than what you're going to use in the near term.”

—DAVID BILLINGS, CIO,
AIRBORNE EXPRESS

Employee Morale

By Simone Kaplan | 92

MORALE IS A BUSINESS ISSUE. Low morale increases turnover, and turnover (when unplanned) is bad for managers, the department and the bottom line. Low morale in the IT staff is the CIO's responsibility to fix, even if the cause is external, like the economy. CIOs with experience at troubled companies in retail and airline industries say identifying a morale problem is the first step toward fixing it. A CIO must listen for clues that lie in what employees are *not* saying. Look for a drop in energy level. Are people no longer contributing to discussions? Are they talking but being pessimistic? CIOs can bolster morale by communicating openly and honestly through the bad times. They should keep training programs in place to solidify a sense of commitment to and investment in the staff. When morale is low, CIOs should treat employees as if they're volunteers, not paid workers.

Cingular's IT Consolidation

By Derek Slater | 100

WHEN THE CINGULAR BRAND WAS LAUNCHED in 2000, the company had 60 call centers, the result of years of mergers and acquisitions. With customer service a key competitive differentiator, Cingular knew it had to consolidate the call centers and its 11 major customer billing systems. Two years later, Cingular runs 20 brand-new multifunction call center facilities and has reduced its billing systems to just two. After taking inventory of its existing systems—1,400 in total—cross-functional teams led by IT began choosing technology standards to use in consolidation. They developed decision matrices to weigh factors such as desired functionality, expected system life spans, the effect of growth and more. Migrations were done slowly. For example, two billing systems now run concurrently, but the company will settle on a single system in 2003. With a similarly measured pace, old centers were kept online as new ones came up. Call loads were balanced among them while systems were tested, employees trained and kinks worked out in the new facilities.

Retail Forecasting

By Meridith Levinson | 116

IN THE RETAIL INDUSTRY, good demand forecasting must account for all the complexities of the business—thousands of products, hundreds of stores, the impact of promotions and supplier problems. In today's economy, it's even more important to get it right and maximize profit when mistakes lead to overstocks. As part of its forecasting toolkit, Sears uses a weather forecasting system, which predicted a mild December in the Northeast. So Sears bought fewer heavy coats and shifted its stock mix away from wool toward lighter leather coats. That worked, but no matter how good the forecasting tool, there will occasionally be leftover items. New price optimization tools can help stores find the highest price they can charge and still move the excess merchandise in a given period.

Case Study: NAVSEA Knowledge Management

By Stephanie Overby | 126

BECAUSE THE REQUISITION OF A U.S. NAVY SHIP or warfare system takes several years, the organization in charge of that process, the Naval Sea Systems Command (NAVSEA), developed best practices to reduce the money and time spent during the acquisition life cycle. It's hard to retain those best practices, however, since NAVSEA invariably loses employees to retirement or new tours of duty during the years it takes to build a naval vessel. A knowledge management database was the answer. But Navy culture emphasizes information confidentiality and internal competition, so sharing information did not come naturally to NAVSEA's 45,000 employees. NAVSEA succeeded by ensuring an immediate reward for sharing knowledge in each best practice area: an easier way to get tasks done. For steadfast resisters, NAVSEA made it impossible for them to work with anyone else without giving up their own piece of information.

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*Mark Hammersmith
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